MONTANA OUTDOORS

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Front Cover
The key to maintaining high-quality hunting opportunities for sharptails (photo: Rocky Hoffmann) involves preservation of key habitat, skillful management, and continued cooperation between sportsmen and landowners.

Inside Front Cover
By radio-collaring some of them, researchers studying the moose population in the Yaak drainage in extreme northwestern Montana have found answers to some interesting questions (photo: Michael H. Francis).

Back Cover
Pheasants are alluring: It has to do with their splashy colors, their derisive cackle, their size—but perhaps most of all with their wily ways. Ring-necked pheasants (photo: Dave Books) have a way of stirring up hunters in a hurry.

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FEATURES

2 Opening Day
by Dave Books, illustrated by Ron Jenkins
Opening day of pheasant season duplicates the noise, confusion, and excitement of the Fourth of July.

4 Outfitters—Do You Need One?
by Jim Zumbo
What are your goals in making a backcountry trip?

7 Perspectives—"The Pipes"
by Ed Merritt, illustrated by Jan Bonham Metzmaker
Opening day at Ninepipe.

8 Choosing a Youngster's First Gun
by R.E. "Bob" Fears, Jr., illustrated by Diane Nugent
First guns help shape a youngster's perceptions of the shooting sports.

15 Bull of the Woods
by Randy Matchett
Researchers are collaring northwestern Montana moose.

19 Partners
by Mike Logan
Partners don't need to finish their sentences.

20 Tune In and Tune Up
by Merlin L. Smart, photos by Mike Aderhold
A clean, sighted-in firearm can boost your hunting success.

25 Teeth Provide Age, Other Info
by Gary and Judy Matson
The teeth from harvested game and furbearing animals provide biologists with valuable information.

27 Adopting a Wilderness
by Bill Sager
A Ronan High School natural history class works to clean up litter in the Mission Mountains.

31 Jumping Water
by Paul Schullery
The wildlife show is highlighted by a silent miracle in the river.

34 The First Saturday After Labor Day
by C. Robert Watts and Frank G. Feist, illustrated by Dave Maloney
Sept. 7: Grouse seasons are finally open.

DEPARTMENTS

11 The Catchall

13 Book Reviews

23 Readers Respond

26 Contributors

Opening Day

by Dave Books
illustrated by Ron Jenkins

It ought to be a national holiday, just like the Fourth of July. In fact, the opening day of pheasant season bears a strong resemblance to Independence Day. There's lots of noise, color, confusion, and impassioned oratory—the latter mostly directed toward errant hunting dogs who have proclaimed an "Independence Day" of their own.

But don't blame it all on the dogs. Ring-necked pheasants have a way of stirring things up in a hurry. Their powerful scent can turn even the most obedient canines into rambunctious, goggle-eyed neurotics. Come to think of it, their masters don't fare a whole lot better; something about the ringneck's splashy colors and derisive cackle tends to short-circuit the nervous system of all but the calmest bird hunters.

Big, gaudy, smart, and raucous, pheasants are as American as apple pie, even if they did originate in China. When Judge Owen Denny, the U.S. Consul-General in Shanghai, shipped several crates of pheasants to Oregon's *continued on page 10*

Painting courtesy of Dr. and Mrs. Richard Dewey

Sunrise is still three hours away when the alarm destroys the dark silence in the tent. Virgil reaches over and fumbles with the confounded clock until he pushes the right button. The tent becomes mercifully tranquil again, and he wriggles into the warm depths of his sleeping bag, although he knows the luxury of sleep is lost. It's time to rise and start a new day. Much has to be done before the greying skies usher in a new morning.

Virgil reluctantly crawls out of the bag and hurriedly slips on a shirt and jeans. He shivers against the chill, crisp night, and reaches for the lantern hanging from the ridgepole. Presently, the tent glows from the brightness of the white mantles, and the welcome hiss of the lantern converts the cold quarters into a hospitable abode.

After nudging several prostrate forms buried in sleeping bags and listening to profound protests, Virgil walks out into the Montana night and takes a deep breath of the sweet mountain air. Moments later his guides follow, and in less than an hour a dozen horses are caught and saddled.

After the chores are done, a hearty breakfast served by the camp cook is washed down by plenty of hot, black coffee. By 5:30 a.m., Virgil, his guides, and the hunters are saddled and ready to ride out of camp. The best hour of elk hunting is the first daylight hour, and they have a long ride to the hunting area. With a bit of luck, one or more of the hunters will collect an elk.

Virgil is an outfitter in the Bob Marshall Wilderness Area, and is one of 584 licensed outfitters in Montana. His business is vital to people who want help in experiencing Montana's outdoors, especially in the backcountry. Hunters, fishermen, hikers, bird watchers—all sorts of outdoor enthusiasts hire outfitters to assist them with a Big Sky adventure.

The decision about hiring an outfitter's services depends on a number of factors. There are advantages and disadvantages, with persuasive arguments on each side.

First, Montana laws do not require residents or non-residents to hire an outfitter or a guide—they are allowed to participate in outdoor activities at will. In the neighboring state of Wyoming, non-resident hunters must hire a guide to hunt in official wilderness areas (this law is currently under challenge in the courts). No such rule governs hunters in Montana.

OUTFITTERS-

There are several reasons for hiring an outfitter. Perhaps the most important one is access. Horses and mules are often necessary to transport people and gear into remote regions. Unless you own your own saddle and pack animals, the only choice is to hike and carry essential items on your back. That gets old in a hurry, particularly if you're not in top-notch physical condition and aren't capable of tackling Montana's trails—many of which seem to lead only uphill.

The trek to remote mountainous regions isn't done because outfitters like to lead folks 15 or 20 miles into the outback. Some of the best hunting and fishing happens in places difficult to reach, and if it's solitude you're after, you'll find it in backcountry areas. Whether you want to catch a mess of cutthroats, pursue a trophy bull elk, or simply enjoy the vastness of Montana's unsullied mountains, one of your options is to leave civilization as far back as you can.

It's possible to rent horses and make a trip on your own, but be advised that you'd better know how to pack. Unless you have the savvy to tie the correct knots and load a horse or mule properly, you'd better forget a do-it-yourself trip where pack animals are involved. Packing is a science. Do it wrong (which is assured unless you're experienced), and you'll cuss the day you planned the trip.

Horses and backcountry travel aren't always part of an outfitter's pro-

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DO YOU NEED ONE?

by Jim Zumbo

gram. Some lease ranches and provide hunting access from a vehicle, some own dude ranches, and many provide float trips for anglers on most of Montana's prominent trout streams.

Another reason to hire an outfitter is to take advantage of his knowledge. A skilled outfitter will know practically every trail in his territory, and he'll know which high country regions produce fish and game. He'll put you into the lakes that produce the best trout fishing, and onto ridges that contain elk, deer, or whatever you're hunting. That's not to say your success is guaranteed—too many other factors influence a fishing or hunting trip. About all an outfitter can do is try his best to make your experience a productive one, whether you measure success in the number of trout you catch and release, or the size of bull elk you tie your tag to.

An important plus in hiring an outfitter is his capability of transporting a big game animal out of the backcountry. A mature bull elk weighs 600 to 800 pounds on the hoof. If you quarter a bull, which is standard procedure, you'll be hefting quarters that tip the scales at 90 pounds or more. And the chore of reducing an elk to quarters is often a herculean task in itself. If you do it on your own, you'll have earned the meat the hard way, and you may never again make an attempt on an elk's life unless a road is handy, or downhill, or both. You'll swear that knives and saws intended for cutting up an elk were invented by sadistic persons who enjoy human suffering, and you'll be convinced that an elk's bones are fashioned of steel.

An outfitter's services almost always include field-dressing, transporting the meat to camp, and hauling it out to your vehicle or to a meat processor where you can arrange to have it delivered to your home. That service in itself is often the bottom line on whether to hire an outfitter or not. It just ain't fun, or even possible, for some folks to move 400 or more pounds of meat through the mountain landscape, most of which will be laid out to make the task as trying as can be.

A final advantage in teaming up with an outfitter is having a bit of comfort around hunting camp. A cook prepares and serves meals, a wrangler or guide tends to your horse, and you'll have a place to sleep. Tents, normally equipped with cots and wood stoves, allow some degree of protection from the elements. In Montana, rapid changes in weather can make life miserable, whether you're fishing in July or hunting in October.

A disadvantage of hiring an outfitter is cost. But don't be surprised if the expense of a do-it-yourself trip closely approximates the price of a guided outing. By the time you buy the necessary gear and food and add in transportation, your savings might be lower than anticipated. The fee for a summer pack trip averages around $90 to $120 a day. A fall hunt costs between $150 to $300 or more a day, depending on the game you're hunting, length of the hunt, and other factors. A bighorn sheep hunt, for example, will be much more expensive than a deer or elk hunt. The fee usually covers pick-up and return to a nearby airport, food, lodging, horses, and transportation of meat. You'll be expected to bring your own sleeping bag, firearm, fishing gear, and personal items. If you want to enjoy an alcoholic libation after the day is done, you're usually expected to bring your own. You must purchase your own hunting and fishing licenses as well.

It is a mistake to hire an outfitter who isn't licensed. He is apt to take you for a horseback ride or a cruise around the back roads, with no intention of showing you game. Montana wildlife officials caution there are numerous unlicensed outfitters in the state. A list of licensed outfitters is available from: Enforcement Division, Department of Fish, Wildlife and Parks, 1420 E. Sixth Ave.; Helena, MT 59620.

How can you select an ethical outfitter, and where do you look for his name and services? There are a number of options. Check the department's list of licensed outfitters. Another way is to check the "where-to-go" section of outdoor magazines. Write to outfitters and request a list of references. Call the references rather than write; you'll learn much more on the phone. Another possibility is to meet outfitters at major sport shows around the country. You'll be able to discuss their operation on a firsthand basis. Another option is to work with a reliable booking agent. It won't cost you any more for this service, and a good agent will be able to direct you to the outfitter best equipped to meet your needs and expectations.

One disadvantage in hunting with an outfitter—although one that can be easily resolved—is the necessity of keeping up the pace set by your guide. Most Montana guides are young and tough and they can walk and climb all day and make the effort seem like child's play. Unless you communicate the fact you're not in the same league in the physical condition department, you'll have a rough time, and your hunt may well turn into an ordeal. Guides don't intentionally try to wear down their hunters—there's just plenty of ground to cover, and time is often of the essence when trying to reach prime game country.

Hunting on your own allows you to set your own speed, and select your own hours. You can sleep as long as you want, and hunt according to your personal requirements. You can, of course, do the same on an outfitted trip, but you'll no doubt want to get the most out of the experience, which means sleeping little, hunting a lot, and feeling sorry for yourself when your less than perfectly conditioned body protests.

To some people, doing something without professional assistance is important. Some folks repair and maintain their own automobiles, and some fix their plumbing leaks and electrical problems. This attitude often carries over to hunting and fishing. Hiring an outfitter is the easy way out, so to speak. These self-sufficient individuals are willing to accept the responsibilities of doing it on their own, and realize a great deal of personal satisfaction by doing so.

Whether you hire an outfitter depends on your personal requirements. You must ask yourself what your goals are in making a backcountry trip, and whether you can afford the cost of a guided journey into Montana's remote mountains.

Although I enjoy hunting and fishing on my own, I count among my most cherished friends a handful of Montana outfitters. These folks are a pleasure to share a campfire with, and I look forward to seeing them as often as possible, whether it's just for a visit over a cup of coffee as I'm passing through town, or hunting with them in a far-off chunk of the world. Besides offering a valuable service, most of them are downright friendly people—salt of the earth, as the saying goes. That means a lot in today's hectic, urban society. ■

JIM ZUMBO

JIM ZUMBO

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An outfitter is vital to hunters, fishermen, hikers, and other outdoor enthusiasts who want help in experiencing Montana's outdoors. A skilled outfitter will know his territory—and he'll know which high country regions produce fish and game.

"The Pipes"

by Ed Merritt
illustrated by Jan Bonham Metzmaker

It's 5:30 opening morning of waterfowl hunting season in the valleys of western Montana. A sky full of stars over Ninepipe National Wildlife Refuge and Ninepipe Wildlife Management Area lends credence to the weatherman's forecast of a bluebird day to come. To the east, the first hint of sunrise silhouettes the Mission Range, and the valley floor below seems alive with movement. Vehicles of every size and description—loaded with guns, dogs, decoys, and hunters with high expectations—converge on favorite potholes and grain fields. It's opening day at Ninepipe; it's a happening!

The familiar voice of Department of Fish, Wildlife and Parks (DFWP) Warden Jim Conner crackles over the radio, "Hey, Ed, you working 'The Pipes' this morning?"

"Ten-four," I reply. "I thought I'd help with the goose pit drawing over on the east side and then see if I can't get onto some early shooting."

"Sounds like a winner," Jim responds. "We've got quite a few vehicles parked over here west of the dike, so I think I'll work this area. Be talking to you. . . ."

As the heater in the old Dodge struggles to drive out the chill, I gulp the last of a third cup of coffee and wipe more fog from the windshield. Up ahead, I catch a glimpse of Hugh Null's taillights as he rounds a corner on Highway 212, heading east toward the refuge. Hugh will be working the south boundary this morning while DFWP Warden Capt. Lou Kis, down from Kalispell to lend a hand, covers the area to the north. As federal refuge officers stationed at the National Bison Range, Hugh and I, along with Lou, Jim, and other DFWP personnel, have wildlife law enforcement responsibility which includes the Ninepipe area.

In speculating about what the hunting public's perception of wildlife law enforcement might be, most officers agree that the majority of sportsmen recognize law enforcement for what it is: an integral part of wildlife management. This relationship can become a bit clouded, however, when the only honker within range all day wings over your blind while the local warden is checking your gun for a plug. Or when you're fumbling for your license with half-frozen fingers—fingers that only minutes ago were snug and warm in those wool gloves the warden is politely holding for you.

A high noon breakfast and "bull session" at Ruby's Cafe on Highway 93 is as much an opening day tradition for enforcement officers as the hunt is for sportsmen. It provides a forum for swapping opener stories—*some* of which are true—and gives us an opportunity to gauge the success of our efforts. After six hours of checking hunters and subjecting ourselves to the usual ration of mostly good-natured comments, we found ourselves seated at a corner table, coffee and menus all around.

Of course the same stories, with minor variation, circulate every year.

"Hey Jim. What did that guy say when you told him he was 'skybusting?' "

"He said, 'Ah, heck, I usually down half a dozen out of a flock like that!' "

"You know, there were at least five dogs working that pothole."

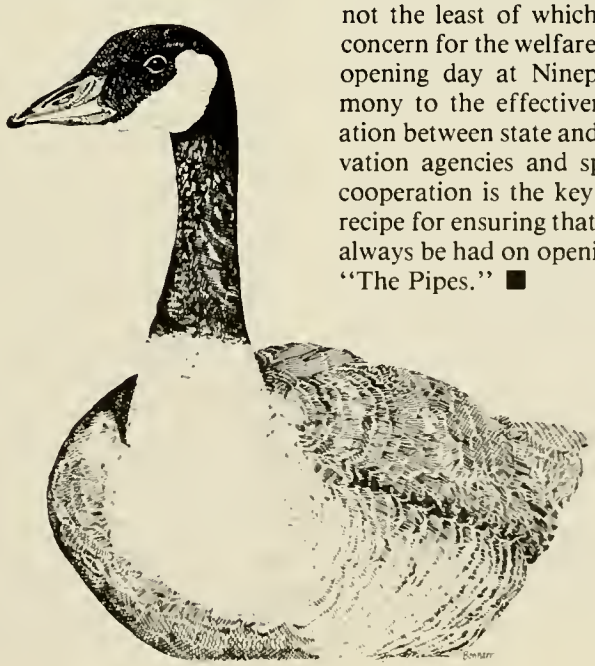
"Yup. And they all had the same name: '#$!!*$#%.' "

Eventually, as jokes and witticisms of questionable quality disappear, along with the orders of bacon and eggs, the conversation turns to the job.

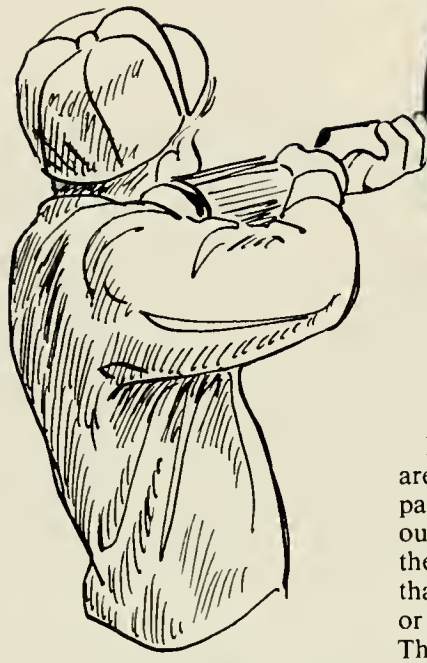
"I saw something interesting out there this morning," Jim remarks. "Three cormorants were flying out of the refuge, down pretty low, and at least five or six hunters shouldered their guns and took aim. But just before the birds crossed the firing line, this guy jumps up and starts yelling, 'Don't shoot! They're cormorants.' It was like someone threw a switch. Every one of those gun barrels disappeared into the cattails and not one shot was fired."

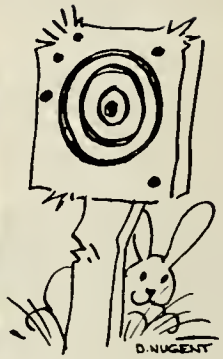
"That's a far cry from what it was like four years ago," Hugh commented. "We had to write at least eight tickets for shooting nongame species that year."

Things have changed, and those changes have been, without exception, for the better. In the final analysis it would seem that duck hunters and duck "cops" have a lot in common, not the least of which is their shared concern for the welfare of wildlife. The opening day at Ninepipe bears testimony to the effectiveness of cooperation between state and federal conservation agencies and sportsmen. That cooperation is the key ingredient in a recipe for ensuring that good times will always be had on opening day down at "The Pipes." ■



CHOOSING A YOUNGSTER'S FIRST GUN





by R.E. "Bob" Fears, Jr.
illustrated by Diane Nugent

If you're like me—a lifelong hunter and shooter—I'll bet you can clearly remember your first gun. In fact, I'd wager that the impression that gun made on you—for better or for worse—was unforgettable. I certainly remember my first shotgun; it was a "beauty" that my dad came home with, a single shot 16 gauge purchased at a local hardware store. It may have looked like a Parker to my inexperienced eyes, but it handled like a post-hole digger, shot like a manure spreader, and kicked like a mule! The only thing that fell to it was my morale.

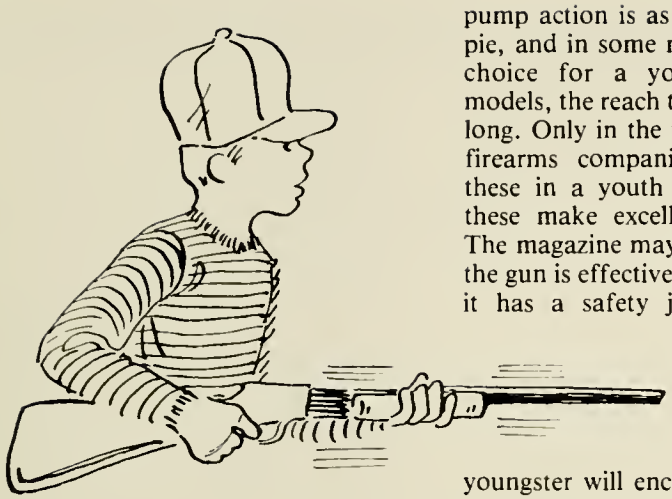
I have long since forgiven Dad for that gun, and in retrospect, it did teach me something: Youngsters have some special requirements when it comes to gun selection and fit. Over the years, as an avid shooter, hunter, and Montana Hunter Safety Instructor, I have been asked by numerous parents to make a recommendation on a youngster's first gun. As a result of many years of experience in the field, on the range, and in the classroom, I've formed some ideas on the subject I'd like to share with you.

First off, remember that first guns are the most important that we as parents are ever going to acquire for our young shooters, for it is through the experiences had with these guns that our children will come to enjoy—or not enjoy—the shooting sports. Thus, it is worth investing considerable thought, and perhaps a little extra money, to get a new shooter started off on the right track.

Remember that a 12-year-old shooter does not have the strength of an adult, so the action should not require a lot of strength to operate. Young shooters have enough to think about with safe gun handling and marksmanship, so they should not have to struggle with a balky or complicated action. Keep it simple. Safeties and clip releases should be easy to find and operate. The gun should be short and light; again, youngsters do not have the size and strength to hold and safely handle adult-sized firearms.

In most cases the "first gun" will be an air rifle. Youngsters should be taught that the air rifle is indeed a gun, and that it demands the same respect as any other firearm. Air rifles come in three basic types: CO_2, pneumatic, and spring. Because the spring and pneumatic types require a fair amount of physical force to cock, I favor the CO_2 type. Remembering my younger days, my "Red Ryder" BB gun caused me more than one set of pinched fingers while trying to cock it. Just thinking of the times I cocked it while resting the muzzle on my foot sends chills down my back! The CO_2 gun requires a minimum of force to operate, allowing the youngster to concentrate on the rules of safe firearms handling.

The next firearm a young shooter will most likely acquire is a .22 rifle. When I was growing up, .22s were often hand-me-down guns, usually in a sad state of repair with many unsafe quirks. I suggest starting a young shooter out with a .22 that, if not new, is in good working order. What type of action? We can rule out semi-autos, pumps, levers, and tubular magazine bolt actions. That leaves only two options: single shots and clip-fed bolt



actions. With a single shot, look for one that cocks on opening or closing of the bolt handle and that has an operable safety. Rifles requiring hand cocking are unacceptable from a safety standpoint regardless of the manufacturer's claims.

The ideal .22 rifle, for my money, is a clip-fed bolt action. These rifles can be unloaded by simply removing the clip and opening the bolt, a minimum of effort for safe operation. Several companies are marketing youth model .22 rifles. If you can't find one of these, don't be afraid of getting a full-sized one and having it cut down to fit. Hours of enjoyment can be had with a good .22 rifle.

The third firearm in your young shooter's battery should be a shotgun. A shotgun must fit the shooter well, if he or she is going to have any measure of success with it. Young shotgunners had few choices in this matter until the last few years, but several firearms companies are now offering scaled-down youth models.

In regard to actions, single shots are usually exposed-hammer affairs and are unacceptable from a safety standpoint. I know this is completely opposite from past teachings, but read on. How many of these exposed hammer guns have you handled? They are hard enough to cock and return to a safe (uncocked) position for an adult, let alone a young, nervous shooter. Single shots with hammers are best left to folks who need something to keep skunks out of the hen house.

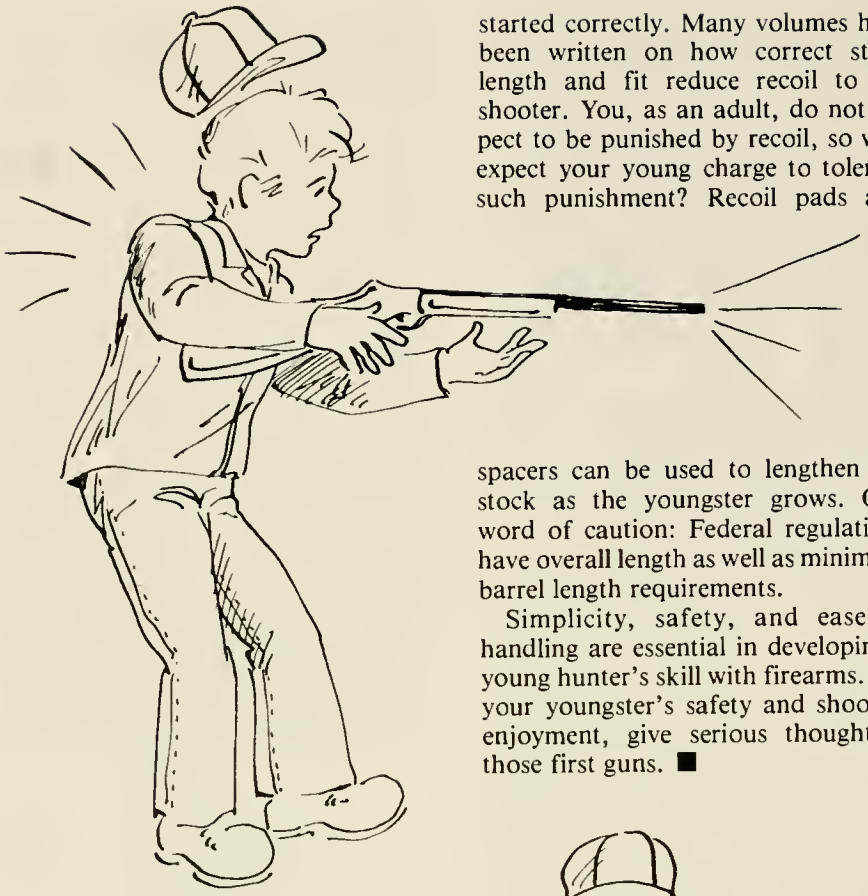
Bolt actions usually don't have the balance required of a good shotgun. I relegate these to the same duty as exposed-hammer single shots. The pump action is as American as apple pie, and in some models, it is a good choice for a youngster; in other models, the reach to the forearm is too long. Only in the past few years have firearms companies started making these in a youth configuration, and these make excellent first shotguns. The magazine may be plugged so that the gun is effectively a single shot, and it has a safety just like those the youngster will encounter on shotguns the rest of his or her shooting career.

The double barrel (side by side or over/under) is an excellent choice for a young shooter if the cost is not prohibitive. By putting a fired shell in one barrel it can be used as a single shot. The double's only drawback could be excessive weight or barrel length, making it hard to hold up and handle. The double is safe and easy to operate, making it a good first gun.

My favorite first shotgun is a gas-operated semi-automatic. No, I'm not kidding. The gas-operated semi-auto has little recoil and if you plug the magazine so that shells can't be inserted, it becomes the safest "single shot" going. The shooter drops a shell in the ejection port, pushes the bolt release, and engages the safety. Upon firing, the bolt locks open, offering a view of the chamber to anyone. To unload the gun, the bolt handle is simply pulled to the rear where it locks open, ejecting the shell. What could be safer or simpler than that?

What gauge should this fowling piece be? There is only one logical choice—a 20 gauge. The 20 gauge offers a good pattern and light recoil, and it is capable of downing everything from doves to Canada geese. The once-popular kid's gun—the .410—should be left strictly to expert wing shots.

Now let's look at a first deer rifle for this young nimrod. As with the .22 rifle selection, let's start by ruling out some types of actions—tubular-fed lever action, pumps, semi-automatics, exposed-hammer single shots, and bolt actions with "blind box" type magazines. Rifles with tubular or "blind box" magazines require cartridges to be fed into the barrel while unloading, making them unacceptable for safe gun handling practices. While



most pumps and semi-autos have detachable clips, they are hard for young shooters to operate. Semi-automatics do not lend themselves to the single shot mode as do their shotgun counterparts. Lever actions with detachable clips and exposed hammers are unacceptable from a safety standpoint. That leaves bolt actions with either a hinged floorplate or detachable clip, or lever actions without exposed hammer and detachable clip.

In choosing a caliber, try to pick one in the .243/6mm/.250/.257/7-08/7x57 class. The best way to sour a young hunter on shooting is to give him or her a rifle with unmerciful recoil. By the same token, don't go to the high-velocity .22s—granted, they have low recoil and are capable of taking deer and antelope, but one must have a good knowledge of animal anatomy and be able to place shots precisely to use them successfully.

Make sure the rifle fits—don't be afraid to have the stock or barrel cut down to make it easier to handle. There are those who subscribe to the theory of leaving the stock alone and letting the youngster grow into it, but this is not the way to get a youngster started correctly. Many volumes have been written on how correct stock length and fit reduce recoil to the shooter. You, as an adult, do not expect to be punished by recoil, so why expect your young charge to tolerate such punishment? Recoil pads and spacers can be used to lengthen the stock as the youngster grows. One word of caution: Federal regulations have overall length as well as minimum barrel length requirements.

Simplicity, safety, and ease of handling are essential in developing a young hunter's skill with firearms. For your youngster's safety and shooting enjoyment, give serious thought to those first guns. ■

Opening Day continued

Willamette Valley in 1881, he couldn't have known he would be instrumental in spawning a new American tradition. The old judge was probably just thinking in terms of a few pheasant fricassees to add spice to his stateside retirement menu. But the long-tailed birds had bigger plans. Within 10 years they had spread throughout the Willamette Valley; Oregon's first pheasant season in 1892 produced a harvest of 50,000 birds on the first day!

Other states were soon clamoring for some of the Oregon birds to stock in their own backyards. Although pheasants had been introduced at various times on the East Coast beginning as early as 1733, these early efforts had always ended in failure. Now, however, the right strain of pheasant had found the right environmental conditions, and the Chinese ringneck population took off like a Roman candle. In the early 1900s, state pheasant farms sprouted around the country in profusion, and the effects of early stocking programs soon began to tell. By 1944, it is said there were 16 million ringnecks in South Dakota alone, and pheasants were prospering throughout much of the nation north of the Mason-Dixon line. The story was much the same in Montana; by the mid-1920s, pheasant populations in some parts of the state were dense enough to cause complaints of crop damage, and by 1940 the ringneck was Montana's most popular game bird, a position it has not relinquished over the years.

Pheasants have had their ups and downs since those halcyon days, but they remain among the most abundant and sought-after game birds on the American scene. They're tough, wily, handsome, prolific, and excellent table fare—all the more reason why Congress should declare the opening day of pheasant season a national holiday (Judge Owen Denny Day would have a nice ring to it, don't you think?). But even if that wise and august body fails to act sensibly between now and Montana's opening day on October 19th, I'll be afield with a bird dog or two, basking in the russet glow of autumn and matching wits with that star-spangled firecracker known as the Chinese ringneck. It's one Fourth-of-July-in-October I try never to miss. ■

A Dam That Didn't Damn Trout

The Beaverhead River between Clark Canyon Dam and the East Bench Diversion Dam at Barretts supports one of the most productive wild trout fisheries in the nation. Wild brown and rainbow trout proliferate in this 16-mile reach of the river, and the best areas may account for up to two tons of trout flesh per mile of river.

The reasons for occurrence of this trout paradise revolve around a stable river channel lined with extensive riparian (streamside) vegetation and water in the necessary quantity and quality to provide for the needs of trout from egg stage to adult. The trout population in the upper Beaverhead hasn't always been at today's levels; to understand how we came to where we are, we must take a look back.

Before 1964, the Beaverhead River ran free, without impoundments, and supported a good trout population. However, during irrigation season, there were frequent severe water shortages in the Beaverhead River. In places, the river was dried up completely below diversion dams. During the 1950s, the Bureau of Reclamation (BuRec) proposed a water storage project on the Beaverhead. It was called the East Bench Unit and consisted of a 261,000-acre-foot reservoir behind the Clark Canyon Dam, Barretts Diversion Dam, and the East Bench Canal, with associated laterals and drains. The project proposed to irrigate over 20,000 acres of previously unirrigated bench land and to provide a more dependable water source for over 28,000 acres of irrigated bottomland.

After years of evaluation and review, a dam 132 feet high was constructed, and it began storing water on Aug. 28, 1964. Water is discharged into the Beaverhead River from the deepest portion of the reservoir at an average depth of 81 feet. The spillway, designed for emergencies, has been used only once—during the extreme high water in 1984.

Since 1966, the Department of Fish, Wildlife and Parks (DFWP) has conducted intensive fisheries investigations on the river to evaluate the effects of the East Bench Unit on the Beaverhead's trout population. From 1966 through 1974, the total number of brown and rainbow trout in the upper Beaverhead averaged less than 600 per mile, probably fewer than existed before dam construction.

During this same period, flow released from Clark Canyon tended to be erratic, with large fluctuations over short periods of time. Spring and fall spawning periods were characterized by extreme flow fluctuations. Some DFWP fisheries biologists believed the fluctuating flows during spawning might be limiting reproduction. So they began talking with representatives of the East Bench Unit and to the BuRec to attempt to stabilize releases at this critical time.

Since 1974, the East Bench Unit, under direction of project manager Dick Kennedy, has carefully managed spring and fall releases to provide stable or increasing flows for rainbow and brown trout during spawning.

This change in flow has not adversely impacted the agricultural water users and has had an incredibly positive effect on trout populations. After three years of stable spawning season flows, numbers of trout had risen from 600 to 3,000 per mile, and biomass (pounds of trout per mile of stream) had increased from 1,000 pounds to nearly 4,000 pounds per mile. Since 1974, the East Bench Unit has played the pivotal role in making the upper Beaverhead one of the finest wild trout fisheries in the nation—by maintaining stable flows during spawning and incubation, and providing winter flows as close to 250 cubic feet per second (fisheries biologists believe that flows less than 250 cfs adversely affect larger rainbow trout) as storage allows.—*Jerry Wells, Region 3 (Bozeman) fisheries manager*

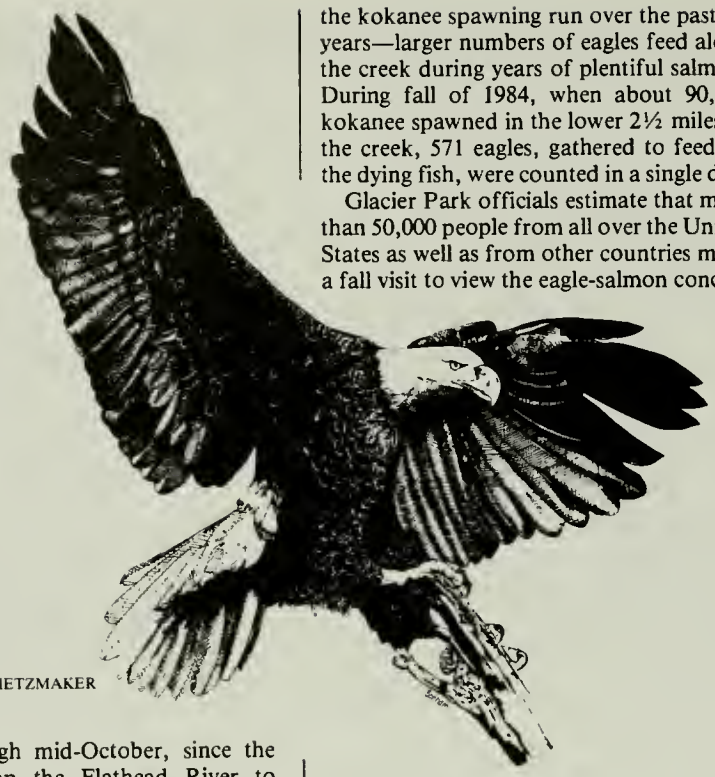
Fall in the Flathead: Kokanee and Eagles

Summer is over in the Flathead; the aspens are beginning to turn, and fresh snow dusts the peaks of Glacier National Park. It is September, and time for the annual fall migration of kokanee spawners from Flathead Lake upstream through the river system. Fishermen cast lures for the red-fleshed salmon, and migrating bald eagles gather at spawning grounds along the river and Glacier Park's McDonald Creek to feed on the dying fish.

The kokanee spawning run in the Flathead River has been depressed during recent years because of unfavorable flows below Hungry Horse Dam, on the South Fork of the Flathead. The Department of Fish, Wildlife and Parks (DFWP) recommended stable discharges from the dam during the kokanee spawning and egg incubation period to eliminate stranding spawning beds. The population seems to be responding. A reasonably strong run of fish is expected in the Flathead River this fall. The kokanee spawning run into McDonald Creek, above the dam's influence, has remained relatively stable over the years.

Fishing for kokanee in the river system usually starts picking up in late August as the first part of the kokanee run moves out of the lake. This early fishery concentrates in the "Salmon Hole," a slow-moving portion of the lower Flathead about two miles below Kalispell. A boat is necessary to effectively fish this area, a staging point for the migrating fish. Shore anglers can catch

Gaining access to private land is the key to success for thousands of Montana hunters each year. Before hunting or fishing on private land, "Ask First!" Bumper stickers urging that action are available from the Department of Fish, Wildlife and Parks headquarters in Helena, and from regional offices in Kalispell, Missoula, Bozeman, Great Falls, Billings, Glasgow, and Miles City. About 20,000 of the bumper stickers were distributed last year; 30,000 are available this year—and the department hopes the demand will equal the supply.



JAN BONHAM METZMAKER

kokanee through mid-October, since the fish migrate up the Flathead River to Columbia Falls, into the Middle Fork near Blankenship Bridge, and upstream to the mouth of McDonald Creek.

The best tackle for kokanee is a light spinning outfit and a small fluorescent orange or pink spoon. Most anglers put several pieces of white or yellow corn on the hooks of the spoon to attract the fish. The fish, averaging about a pound, are strong fighters when hooked and are delicious either cooked or smoked. The 1985 daily and possession limit for kokanee in the river system is 10.

Kokanee which spawn in McDonald Creek in the park attract the largest fall concentration of bald eagles in the lower 48 states. Riley McClelland, Glacier National Park biologist, has called the gathering "the densest seasonal concentration of bald eagles in the world." The eagle congregation has been closely tied to the strength of the kokanee spawning run over the past six years—larger numbers of eagles feed along the creek during years of plentiful salmon. During fall of 1984, when about 90,000 kokanee spawned in the lower 2½ miles of the creek, 571 eagles, gathered to feed on the dying fish, were counted in a single day.

Glacier Park officials estimate that more than 50,000 people from all over the United States as well as from other countries make a fall visit to view the eagle-salmon concentration. The best vantage point is Apgar Bridge near West Glacier. Plan your trip between late October and early December for the best viewing.

As summer passes into fall, start thinking about an autumn trip to the Flathead. If you enjoy fishing or viewing wildlife, you won't be disappointed.—*John Fraley, Bonneville Power Administration studies manager, DFWP, Region 1 (Kalispell)*

New Trespass Legislation

The 1985 Montana Legislature passed several new laws affecting both recreationists and landowners in Montana. Before discussing the new trespass law in detail, the Department of Fish, Wildlife and Parks emphasizes that no amount of legislative action or rule making can do more to promote harmony between private landowners and recreationists than the individual actions of the parties concerned.

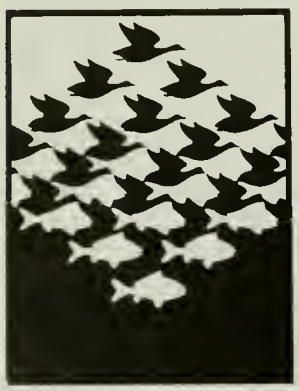
Recreationists must realize that private landowners *do* have the right to fence, post, and limit access to their properties as they see fit, within the confines of the law. Recreationists also should realize their personal actions on private lands may influence landowner attitudes toward recreationists as a whole and determine the availability of those lands for public recreation in the future.

The trespass law. With passage of House Bill 911, the 1985 Montana Legislature addressed the issue of trespass. The trespass law states that lands can be closed to public recreational use either by posting the land or through verbal communication by landowners or their agents. However, even if lands are not posted, recreationists are urged to seek landowner permission before pursuing any activities on private lands. The landowner can revoke permission by personal communication at any time.

Posting requirements. Notice denying entry to private land must consist of written notice on a post, structure, or natural object, or of notice by painting a post, structure, or natural object with at least 50 square inches of fluorescent orange paint. In the case of a metal fence post, the entire post must be painted. This notice must be placed at each outer gate and all normal points of access to the property, as well as both sides of a stream where it crosses an outer property boundary line. In cases where land ownership is on just one side of a stream, only that side needs to be posted.

What does the new law mean? Because landowners are no longer required to post the entire perimeter of their land to deny access, it is the recreationist's responsibility to determine whether private lands are posted. If lands are posted, it is the recreationist's responsibility to obtain permission from landowners before recreating on these lands. The new law does not change the requirement that **all big game hunters must obtain permission from landowners before hunting on private lands.** Permission is required, even if the land isn't posted.

Enforcement of the law. The law also extends the authority of state game wardens to enforce the criminal mischief, criminal trespass, and litter laws to all lands used by the public for recreational purposes. Recreational purposes are defined by law to include hunting, fishing, swimming, boating, water skiing, camping, picnicking, pleasure



National Hunting & Fishing Day®
September 28, 1985

driving, winter sports, hiking, and other pleasure expeditions.

Penalties. As stated in Montana law, any person who knowingly enters or remains unlawfully in or upon the premises of another will be guilty of criminal trespass and, if convicted, will be fined not to exceed $500 or be imprisoned in the county jail for a term not to exceed six months, or both.

Assistance for landowners. Landowners requiring the assistance of law enforcement officers as it relates to this new law should call either their local game warden or county sheriff. The department also maintains a toll-free number (800/332-6117) for reporting violations.

If you are a recreationist, seek landowner permission before recreating on private land. Doing so is *always* good policy. If you are a landowner, please respect the rights of recreationists to enjoy our public lands and waters, and understand their desire to enjoy the many recreational opportunities private lands present. Remember, most recreationists are honest, responsible citizens and they appreciate the opportunities afforded them by landowners.

BOOK REVIEWS

UP ON THE RIVER, by John Madson, Nick Lyons Books, 31 W. 21st St., New York, NY 10010; 1985, 276 pages, $17.95, hard cover.

If there were a John Madson fan club, I'd certainly qualify for membership, probably even for the presidency. I think of him as our generation's Aldo Leopold, and I believe the natural history books and magazines of 50 years hence will proliferate with Madson quotes, just as ours do with Leopold.

Like many of you, I'm no newcomer to his writing. When *Audubon* arrives, the first thing I do is check the index to see if Madson's there. His 1979 book, "Out Home"—a sensitively edited collection of some of his finest magazine pieces—is still one I take from my shelf, look through, think about, and treasure. I could hardly wait for him to finish his tallgrass prairie book; he did so in 1982, and "Where the Sky Began" met my expectations, and then some.

Now about "Up on the River." Other reviewers have pointed out that Madson is not the first (nor will he be the last) to "chronicle" the Mississippi. He's got some tough competition in writers of the Mark Twain caliber, but his is not a tale in the Twain sense. In some ways, it's more. It's detail and the pooling of years of rivers and the outdoors—plus some careful research—that make this book about The River truly different.

Take his observation about Joe, the river man in a chapter called "Shell Game." Madson describes Joe's faded shirt and his jeans stuffed into patched hip boots; he notes the hip boots have the leg straps cut off. Few of us would notice that, and even fewer would have the sense to figure out why: so Joe could kick off the boots in deep water if he needed to.

I'm married to an Iowa boy who spent a summer working on a towboat on the Mississippi, and there's still a lot of Tom (and Huck, too) left in him. I've got to admit I've caught some of his Mississippi fever. When we're back in Iowa and we visit the river towns—Dubuque, Prairie du Chien, Muscatine, Guttenberg—I notice a faraway look in his eye. The look is about river smells and noises, picking up barges at McGregor, boys growing into men, and men growing back into boys.

Madson captures all the magic, the folks, the threats to The River, the onslaughts it has managed to withstand. If you like rivers, words, biology, history, or people anecdotes told with humor and charm, don't miss Madson's chronicle of the upper Mississippi. If "pictures" are more to your taste, the illustrations by Dycie Madson are as suited to this book as eating fried catfish in Burlington. Her art's intricacy bespeaks a familiarity with the outdoor world she shares with John Madson; her illustrations impart even a deeper meaning to his marvelous prose.—*Kay Ellerhoff, associate editor*

THE LAST BOOK: CONFESSIONS OF A GUN EDITOR, by Jack O'Connor, The Amwell Press, Inc., 65 Old Route 22, Clinton, NJ 08809; 1984, 247 pages, $30, hard cover, slipcased.

Most folks interested in guns and hunting are familiar with Jack O'Connor's writings. O'Connor, who died in 1978 at the age of 75, was gun editor of *Outdoor Life* for three decades and a big game hunter of considerable renown. His fans (during the 1950s, he'd often receive more than 3,000 fan letters a month) knew him as an experienced, knowledgeable hunter and an excellent writer. But what about Jack O'Connor the man?

"The Last Book" provides a fascinating glimpse into the life of this complex individ-

SPORTSMAN'S CALENDAR
1985-86 GENERAL SEASON DATES

Elk, Deer, Bear
General Rifle Seasons—Oct. 27 through Dec. 1, 1985
General Archery Seasons—Sept. 7 through Oct. 12, 1985

Big Game Species	Opening Date	Closing Date
Antelope	Oct. 13	Nov. 10
Archery	Sept. 7	Oct. 12
Bear, black	April 15	Dec. 1
Deer (backcountry)	Sept. 15	Dec. 1
Deer	Oct. 27	Dec. 1
Archery	Sept. 7	Oct. 12
Elk (backcountry)	Sept. 15	Dec. 1
Elk	Oct. 27	Dec. 1
Archery	Sept. 7	Oct. 12
Goat, mountain	Sept. 1	Dec. 1
Lion, mountain	Sept. 15	Feb. 15
Chase season	Feb. 16	April 30
Moose	Sept. 15	Dec. 1
Sheep, bighorn	Sept. 1	Dec. 15
Fishing		
Streams	May 18	Nov. 30
Lakes	Open entire year	
Turkey		
Spring	April 20	May 12
Fall		
West and Central districts	Closed	
Bull Mountain District	Oct. 27	Dec. 1
Southeastern District	Sept. 7	Dec. 1
Carter County	Sept. 7	Oct. 26
Upland Game Birds		
Dove	Sept. 7	Nov. 5
Grouse	Sept. 7	Dec. 8
Partridge	Sept. 7	Dec. 8
Pheasant	Oct. 19	Dec. 8

ual, a man who was crusty, outspoken, and by his own admission "driven"—but who was also generous, devoted to his family and friends, and capable of laughing at his own foibles as well as those of others. These qualities are amply demonstrated in the book's 20 chapters by O'Connor, a foreword and "Final Farewell" by his son Bradford, and an introduction and concluding chapter by Jim Rikhoff, who was the driving force in getting "The Last Book" published.

Rikhoff explains the sequence of events in the introduction: "... after being regaled [by Jack] with tales of derring-do and strange characters of recent and not-so-recent history, I finally posed the question: Why didn't he write a book that told all the great stories he had related to me over the years, which he couldn't put in print because (1) the publisher would have fits (2) the advertisers would raise Cain (3) lawsuits and (4) censorship?" The result is a book that gives an insider's look at the life and times of Jack O'Connor—at big game hunting in North America and Africa, at the outdoor writing and publishing business, and at the arms and ammunition industry. It's honest, funny, sometimes irreverent, and always entertaining.

Two other trade editions of Jack O'Connor's writings were published by The Amwell Press in 1984: "Game in the Desert Revisited" and "The Best of Jack O'Connor." These are available as a set, slipcased, for the special price of $50.—*Dave Books, editor*

The Naming of Pelican Point

How are state park sites named? Most often, they are named after a historical or geographical feature, after the landowner, for a city or structure located nearby, or sometimes they already have a name before the department acquires them. Occasionally, they are named in a "special" way. Such was the case with a newly acquired 95-acre site six miles south of Cascade on the Missouri River.

Region 4 (Great Falls) parks personnel showed the students in Mrs. Carol Woody's junior high history classes at the Cascade School a slide series on the region's parks. Then, the students were given three weeks to study and inventory the newly acquired area and submit a name. Fifty-four names were suggested, and Mara Tomlinson's entry—"Pelican Point"—won. The area is visited by these large birds during the warm months, and recreationists enjoy seeing them.

The "Naming of a Site" program also was the theme for the Parks Division portion of this year's State Fair exhibit.—*Debbie Cheek, Region 4 (Great Falls) Parks Division administrative assistant*

Black or Grizzly Bear?

With hunting seasons opening soon (check with the Montana Department of Fish, Wildlife and Parks, 1420 E. Sixth Ave.; Helena, MT 59620, for details), it is imperative that hunters positively identify their target before shooting. Between 1975 and 1985, the department documented 10 grizzly bears killed because they were mistaken for black bears. These mistakes seriously threaten the limited grizzly bear season in Montana, as well as the spring black bear season.

It is not always easy to distinguish between black and grizzly bears. Color and size are not dependable criteria, so other features must be looked for, such as overall profile, shape of the head, line of the back, and claw length. As a hunter, it is your responsibility to make a positive identification. If you are not sure, don't shoot!

Look for a combination of characteristics to make identification

BLACK BEAR

1. No prominent shoulder hump. Highest point of body is the back.
2. In profile, muzzle is straight and long. Frontally, head and face appear round.
3. Claws dark, much shorter and more curved than grizzly claws.

GRIZZLY BEAR

1. Highest point of back is a muscular hump over the shoulders.
2. In profile, distinct brow gives "dished" look to face. The brow is not as well defined in yearlings.
3. Front claws are long, very prominent, and often light colored. Can sometimes be observed from great distances.

RON AASHEIM

Teddy Thompson and Dick Campbell have donated a mounted turkey to the Department of Fish, Wildlife and Parks. Thompson (left) is pictured presenting the mount to DFWP Director Jim Flynn. The turkey is displayed at the department's Helena beadquarters. The 22-pound tom was taken in Fergus County in spring of 1982. Montana Taxidermy of Big Timber, owned by Bill Moen, mounted the big bird.

BULL OF THE WOODS

by Randy Matchett

CONRAD ROWE

I crouched in a tree well beneath a wide, spreading cedar and tried to keep from shivering. My partner Rick crunched through the snow about a hundred yards away, circling, keeping the moose between us. I saw only patches of brown hair through the brush as the bull began moving in my direction. He walked slowly toward me until he was only 40 yards away, stopped, turned his head, and cocked his ears in Rick's direction. Still too far for a good shot.

Rick closed in, and the moose moved in my direction again. Just two more steps past that tree . . . a perfect 20-yard shot right in the middle of his hip. As he bolted, I saw the tranquilizer dart hanging from the center of his right hindquarter. Rick approached, and I gave him the "thumbs up" sign. We waited about eight minutes for the drug to take effect and then began tracking through the snow.

The bull traveled less than 150 yards before the drug immobilized him. He was well-positioned, lying on his brisket with his legs folded beneath him. He held his head high and rotated his ears toward us as we approached. While I removed the dart, Rick fitted a radio collar around his neck. This radio was designed to transmit a signal for almost four years. We estimated he weighed between 800 and 900 pounds. We then looked at the wear on his teeth to determine an approximate age and

gave him an injection of a drug to reverse the tranquilizer's effects. Within 10 minutes, he stood up and walked away. The whole process took less than half an hour. Telemetry information from this bull will provide answers to questions about movement patterns, home range size, and habitat use for moose in the Yaak River country of northwestern Montana.

Begun in June 1981, this study is the first intensive work on moose in northern Montana and one of the few in the Pacific Northwest. Moose have been studied previously in southwestern Montana and in the adjacent areas of Jackson Hole, Wyo., and the Henry's Fork in Idaho. These sites differ from northwestern Montana in climate, vegetation, and elevation. Northwestern Montana is influenced by Pacific Coast weather patterns characterized by moderate temperatures and more than 40 inches of precipitation each year. Abundant moisture, low elevation, and rolling terrain result in thick, continuous forest canopies in undisturbed areas. Much of the moose range in the other studies contains extensive willow flats, aspen stands, and mountain park lands. These vegetation types are not found in extreme northwestern Montana.

Most studies indicate that early successional habitats containing many young shrubs and few mature conifers are important to moose. They also use old forests and other vegetation types and many questions exist about their relative importance. Logging creates early successional vegetation communities, and the Yaak Ranger District in the Kootenai National Forest harvests timber from several thousand acres a year. Although logging almost certainly increases forage production, other habitat requirements may be compromised if cutting operations are poorly designed. We wanted to learn how logging affects moose habitats in wet-type forests, and how planned timber harvesting can enhance moose habitat.

This research project cooperatively involves the USDA Forest Service (Region 1, Kootenai National Forest); the USDA Forest and Range Experiment Station; the Louisiana-Pacific Corporation; J.E. Davis, a Yaak Valley resident and president of the Winn-Dixie Corporation; the Montana Cooperative Wildlife Research Unit; the University of Montana; and the Department of Fish, Wildlife and Parks. Together we tried to determine how moose utilize the many habitats available and how they respond to various logging practices.

RON SHADE

Most moose calves are born during late May or early June. The bond between cow and calf is strong, and the cow is aggressive toward anyone who approaches too closely.

About 15% of Montana's moose permits are issued for the Kootenai National Forest. The Yaak drainage is an important part of the Kootenai's moose habitat, and hunters enjoy a high success rate.

The Yaak offers diverse vegetation. Stands of ponderosa pine and Douglas-fir occur on the relatively dry southern exposures. Moist slopes, with thick forests of cedar and hemlock, are widespread. Other habitats include swamps, lodgepole pine thickets, and upland subalpine fir, alder, and fool's huckleberry stands.

Parts of the Yaak have been logged intensively, while other areas are undisturbed. Intensive logging began in the Yaak in the early 1950s in an effort to salvage dead trees killed by spruce bark beetle infestations. Many current logging operations concentrate on lodgepole pine stands infested with mountain pine beetles. The wide variety of habitats, current logging activity, the presence of a well-established moose population, and the importance of moose to Montana sportsmen made the Yaak River drainage an excellent place to study moose.

To study habitat use patterns, we placed radio collars on 12 moose (eight cows and four bulls). We were most interested in the cows because they represent the reproductive segment of the population. During the study, one transmitter failed, one moose lost its collar, one bull died of natural causes, and another was legally shot by a hunter in Canada. I tried locating each

RON SHADE

Sooner or later, moose could probably be found on just about every square inch of the Yaak drainage. In early winter, the snow stays light and powdery; moose can move easily through it and they are often found in clearcuts. When it grows colder, moose and other wild animals require timbered, sheltered areas.

STEVE WIRT

Most outdoorsmen know that moose feed on shrubs in clearcuts and munch "moose moss" in the swamps. One of the goals of a cooperative study of moose in extreme northwestern Montana was to find out where they are when they are not so easily visible.

animal three to four times per week. Keeping up with eight animals on the ground is about all that one person can do. Each one ranged over a great deal of country within the 200-square-mile study area.

Most outdoorsmen know that moose feed on shrubs in clearcuts and munch on "moose moss" in the swamps. So why go to the trouble and expense of radio-collaring and tracking them? Cut-over areas and swamps are easy places in which to see animals, but where are they when they are not so easily visible? How much time do they spend in timber where we don't see them? Where do they go at night? How many moose may be in low visibility areas? With telemetry, we can locate the animals at any hour, in any habitat, and we can do so without disturbing them. Based on how many times we find radioed animals in different habitats, we can begin to understand the full range of areas that moose select and avoid.

In addition to radio-collaring moose, I identified specific individuals during the summer. Distinguishing one moose from another is fairly easy by noting antler shape and development, presence or absence of calves, the shape of the "bells" (dewlaps) that hang from the throat, the markings of the light-colored hind legs next to the dark-colored rump, and old scars or other features.

I suspect that sooner or later, a moose could be found on just about every square inch of the Yaak drainage. After spending 18 months in the field and walking hundreds of miles observing moose throughout the hills, what generalizations can we make about the importance of various habitats to moose?

During early winter, moose often feed in clearcuts. Shiny-leaf and redstem ceanothus, red-osier dogwood, and mountain boxwood provide excellent forage at that time of year. Ceanothus and other browse species regenerate well if the scattered slash is burned after logging. Burning promotes establishment of key browse species by recycling nutrients, reducing duff accumulation, preparing a seed bed, and removing competing vegetation. Burning also reduces slash build-up that may hinder mobility of moose and other ungulates.

During December and part of January, the weather typically stays cold and the snow is light and powdery. Moose move easily through 30 inches of fluffy snow and are often found in clearcuts.

Later in the winter, it may rain, refreeze, and then snow again. During these periods of freezing and thawing, snow develops crusty layers with varying ability to support moose. Anyone who has walked through deep snow—with every step breaking the crust and then sinking deep into it—realizes the huge amount of energy required. During these times, moose and other game animals need timbered, sheltered habitats.

During unstable snow conditions, moose minimize their movements and remain in thickly timbered areas. Thick forest canopies intercept snow, resulting in less snow on the ground. Also, snow conditions vary less on the shaded forest floor than in open areas exposed to the sun. Since it remains cooler under the trees during the day, the snow stays harder than out in the open where the sun weakens crusty layers and makes it wet and heavy.

During midwinter, a cold snap might freeze slushy snow into a very hard crust. This hard snow allows moose to walk readily without breaking through. Under such conditions, a radioed cow with a calf traveled at least 18 miles in four days, through areas with snow from three to over six feet deep. With hard snow, moose are able to move great distances and use foraging areas inaccessible during periods of unstable snow.

Use of winter habitat by moose in the Yaak differs from use of river bottom, willow flat, and aspen winter ranges in southwestern Montana. During two winters, I only once found a moose in the Yaak River bottom. Instead, I found moose on southern slopes and in cutting units as snow conditions allowed.

Northwestern Montana does not have extremely dense willow and aspen areas for moose to feed in. Spacing small tree-cutting units in wintering areas and maintaining a connected network of mature forest canopies benefits Yaak moose winter ranges. Forage production increases in the clearcuts, and travel corridors help moose obtain necessary food and minimize energy expenditures.

In contrast with willow and aspen winter ranges of southwestern Montana, good winter range on the Yaak is a mosaic of clearcuts of various ages and closed forest canopies. In both parts of the state, moose seek southern exposures and low elevations and may use a small area intensively if there is adequate forage. On the Clearwater National Forest in Idaho, some moose wintered next to the Bitterroot Divide in very deep snow. Evidently, the forage density was great enough to offset the energy expended in coping with the deep snow.

As spring approaches in the Yaak and snow begins to melt, moose move to higher elevations around 4,000 feet. Moose use clearcuts more in spring, and feed on browse that was covered all winter by snow.

Most calves are born during the last week of May or the first week of June; the cow is secretive at calving time. It's best to avoid cows because "mother moose" has earned a reputation for aggressiveness toward anyone who approaches too closely. The bond be-

tween cow and calf is strong. A moose calf is most vulnerable to predators during its first two to three weeks of life, and it depends on the cow for protection. A calf's survival during winter also depends on its mother, as calves would have trouble moving through deep, heavy snow if they were not able to follow trails broken by the cow.

Coordinating timber harvest with wildlife needs is a useful and powerful management tool.

Three of four adult radio-collared cows that had calves during spring 1983 selected thickly timbered sites in which to give birth. They remained at or near these secure sites until mid-June and then moved to higher summer ranges. Selection of thick habitat and the 10- to 14-day rest period is different than what has been reported for moose in the Gravelly and Snowcrest mountains of southwestern Montana. There, researchers noted newborn calves on dry, open sagebrush areas. A movement of over two miles was reported for a cow and a 3-day-old calf.

During the 1950s, spruce bark beetles became epidemic, and many of the high spruce basins in northwestern Montana were logged. Today, these areas have regenerated into thick stands of fool's huckleberry, honeysuckle, alder, and other shrubs. The main tree is subalpine fir, with some spruce saplings growing in the understory. The '50s logging has created summer moose habitat today. By comparing moose habitat use today with past logging practices, we can plan the future timing and spacing of cuts, thereby enhancing moose habitat. Coordinating timber harvest with wildlife needs is a useful and powerful management tool.

Other moose had summer ranges in lodgepole or hemlock stands. Summer home ranges in hemlock or cedar forests usually were adjacent to cutover areas. In southwestern Montana, summer ranges often included subalpine meadows and lodgepole pine forests. Willow flats were the major part of summer ranges for many Jackson Hole moose, but upland forest types were also used.

Some moose in the Yaak use swamps and river backwaters during summer. In these wet sites, they feed on *Elodea* (waterweed) and aquatic buttercups. Moose seek these aquatic plants during summer, at least partly because of their relatively high sodium content. Many moose make brief trips from their small, upland summer core areas to lowland aquatic feeding sites. I radio-tracked a cow and her calf from a high summer area five miles down to the Yaak River in less than 10 hours. They stayed in or near the river for four days, and both of them were back in their summer core area on the sixth day. Other radioed moose showed similar patterns—making a trip or two from high elevations to lowland aquatic feeding sites, staying there for a few days, and then returning to their summer range.

Frequently during summer, I saw a specific, identifiable moose at an aquatic site for several consecutive days. Then, that individual would disappear and perhaps a new animal would show up. Aquatic feeding sites are important to moose. A single wet site may be used by many different moose that occupy a broad geographical range, with each one coming down from the high country to feed for a few days.

Home range size varies greatly for individual moose. Typically, a year-long home range might cover 25 square miles, but this varies from 10 to over 40 square miles. Sizes of home ranges in the Yaak are slightly larger than those reported for southwestern Montana, and much larger than those reported for the Jackson Hole area.

Winter home ranges are generally smaller than summer home ranges. A young bull spent January and February in an area of less than one square mile. Other moose occupied winter ranges of three to five square miles. Their summer home ranges covered 10 or more square miles.

Summer home ranges of 1.5 square miles or less have been reported for moose in Jackson Hole and the Lower Gallatin Valley. In the Yaak drainage, intensively used summer areas were also small, often in or near old spruce logging units. However, total summer home ranges for Yaak moose may cover more than 20 square miles.

Moose movements vary greatly. A 3-year-old bull traveled 30 air miles north into Canada and had a home range of 55 square miles. Another young bull had one of the smallest home ranges (six square miles) of the radio-collared individuals. Movements between summer and winter ranges for some Yaak moose amounted to only four or five miles, while others moved more than 10 miles. Other studies have delineated migratory and non-migratory segments of moose populations. All of the Yaak moose showed definite movements from summer to winter areas.

Moose use logged areas, but shelter found in closed canopies is important in winter. Sixty percent of almost 700 radio locations of undisturbed animals were found in timbered stands. When moose were found in logged areas, cuts between 10 and 25 years old and less than 40 acres in size were frequented. These clearcuts contain favored forage plants and plentiful hiding cover. In older clearcuts, forage plants grow old and lose their vigor, as young trees begin to replace them. In younger clearcuts, forage plants have not had time to establish themselves and a lack of cover may cause moose to avoid these areas.

We are just beginning to understand some of the relationships between moose, their habitat, and logging. With proper planning, we can harvest timber and maintain a well-balanced mosaic of all the habitat requirements of moose. This will include secure timbered areas, undisturbed aquatic feeding sites, adequate upland summer areas, and enough foraging areas created by logging of the right age, size, and configuration. Prescribed fire and slash disposal with broadcast burning after logging will enhance areas for many species of wildlife. Coordinating complete logging prescriptions and wildlife needs can lead to productive habitats and productive wildife populations. Cooperation in natural resource management will provide needed products as well as abundant wildlife for viewing and hunting. ■

MIKE LOGAN

PARTNERS

by Mike Logan

'Member that day in the. . . ?"

"Yeah. That was really great! That one buck almost ran me down."

The big green power wagon almost steered itself to the Pintail Hole.

"I 'as just thinkin'. . . ."

"Me too. That was a beautiful double! The only two ducks in the sky. They were really high that day."

continued on page 24

Tune In and Tune Up

With a properly cleaned and sighted rifle, you are ready for some target practice. The author here demonstrates the proper form for shooting from the sitting position. Remember, there is no substitute for time spent shooting.

by Merlin L. Smart
photos by Mike Aderhold

Every fall, as sure as the leaves drop and honkers and mallards head south, a primeval instinct changes a group of average folks into "Great American Hunters." Common sense goes to the prevailing winds, lawns go unattended, business appointments are forgotten, wives are lost in a time warp, and preparation for the annual trek to the bush begins.

Cavemen of yesteryear simply sharpened flints, tightened arrowheads and spearheads, flung on a bearskin robe, and headed out. Today, preparation is somewhat different. Trucks, campers, trailers, and winches are checked and rechecked and given shakedown runs. Lanterns are dragged out and extra mantles are stocked. Tent poles are counted; rope, meat saws, survival kits, clothing, boots, binoculars, and maps are packed; everything must be ready.

Finally, the night before exodus, "Ol' Betsy"—granddaddy's 06, 30-30, or whatever—is pulled from hibernation and dusted off. All is ready for the safari to begin.

Opening morning arrives. Hours of preparation, a long, quiet stalk, and the cross hairs settle squarely on the shoulders of a six-point. The first shot is a clean miss.

While such stories are common, they are not the rule. Lightning strikes, sonic booms, itchy fingers, buck fever, and sun blindness all are blamed, but it is never "Ol' Betsy's" fault. Hours spent scouting elk, weekends watching that eight-point whitetail, and days of pre-hunt glassing for pronghorns go up in smoke because of a common error: rifle neglect. Two or three hours of basic firearms care, a few hours on a range, and investment of a few dollars in a cleaning set and some gunsmith's screwdrivers could go a long way toward filling the freezer.

Let's begin with basics: a clean, mechanically sound firearm. Most hunters today shoot one of four types of actions: bolt, lever, automatic, or pump. Simple disassembly for cleaning is not difficult and if an owner needs aid in breakdown techniques, most gunsmiths or gun dealers would be happy to help. There are also countless volumes published on almost all types of firearms, from blackpowder to magnums.

Cleaning means separating the stock, in most cases wood components, from the metal parts and removing the bolt assembly from the receiver group. The bolt, trigger assembly, and receiver group should be cleaned thoroughly with a solvent or a detergent and hot water solution, dried, and lightly oiled. All parts should be checked for excessive wear. If any doubts arise, this is the time to see a competent gunsmith, rather than to have failure in the field. A worn sear, weak firing pin spring, or simply a fatigued retainer pin has ruined more than one well-planned hunt.

Now that we have talked you into tearing "Ol' Betsy" down, we may as well run a patch or two through the bore. Actually, with today's soft-jacketed bullets and high velocity rifles, we have to do more than an annual bore swab to ensure an accurate barrel.

Each year, modern Daniel Boones show up at hunting camps and shooting ranges lugging shooting irons that have five years of copper plugging their tubes. Then they wonder why their favorite firearm can't hold a 10-inch group at 100 paces. Some customers have brought in rifles, claiming the bore was "shot out"; I know they have moved less than 200 rounds. The sad owner would have happily parted with enough green for a new barrel, when a good soaking and scrubbing could bring him to an inch grouping at a hundred yards.

Select a good cleaning rod. I prefer steel, or at least brass. Too many aluminum rods fold up halfway down the bore with a tight patch. Use a commercial bore cleaner and a brass brush of proper caliber. Make three or four passes clear through the bore both ways for each brushful, then follow with several clean, dry patches. If the telltale green color of copper fouling is still present, plug the chamber (an empty shell case wrapped with paper towel or cork works nicely) and pour solvent down the muzzle. Set the piece aside for a day or two, reswab the bore, and repeat the process until the fouling is gone.

Sure kills at 200-plus yards depend on several factors—other than a well-aimed, properly squeezed shot—and a clean bore scores high on the list.

Tuning up a rifle should begin with a thorough cleaning and inspection for excessive wear. This means separating the stock from the metal parts so that the bolt, trigger assembly, and receiver group can be cleaned with solvent.

Always fire at least three shots to establish a group before you make a sight change. On a scoped rifle, each minute of sight change will move your bullet left, right, up, or down one inch per 100 yards of range. If you are unable to shoot beyond 100 yards, remember that most big game rifles zeroed two to three inches high at 100 yards will place a bullet in a 12-inch kill zone out to 300 yards.

Again, don't rely on just an oil patch run through the barrel annually. This won't do the job. Use any of the commercial cleaners. Many old-timers swear by "Grandma's panther milk," but I'll put my money on today's G-66, Gunslick, or Hoppe's, to mention a few.

Now let's clean that stock and check for splints or cracks. Plain old detergent and water works wonders. Keep petroleum-based cleaners away from your wood. Oil breaks down the wood fibers and turns a good bedding job into a sponge that lets your action play hopscotch every time you touch it off. If your rifle is oil-soaked, this will usually show in the rear tang area or behind the recoil lug, and if soaking with carbon tetrachloride or lacquer thinner won't pull it out, removal of the saturated wood and a fiberglass bedding job may be your stock's only salvation.

Once your stock is freed of oil and rats' nests, check for telltale wear marks of poor bedding in the recoil area. If a fore end on a one-piece stock shows signs of excessive pressure on either side, correct this by scraping a few thousandths clearance in this area. If you are not adept with stock work, don't mess with it; instead find someone who knows what should be done. Excessive pressure in the fore area can cause a shot spread of 12 inches or more at 100 yards, and one inch at 100 yards is two inches at 200. A four-inch miss at 100 yards is translated to 12 inches off at 300 yards.

Once you are satisfied your action fits the stock cleanly and solidly, seal your stock's bedding area with a reputable wood preservative, such as tung oil or one of the high-quality varnishes. Apply several thin coats rather than one glob of goop. The idea is to penetrate the bedding area and seal out moisture. A good glass bedding job will keep "Ol' Betsy" accurate for years. This is a must for heavy caliber and magnum rifles, and bedding kits are available at almost all sports shops.

If you have kept your parts in seal-tight bags throughout these labors, you should be ready for reassembly and, with luck, once your firearm is back together, there will be no extra pieces. As you reassemble, check all screws. If you are shooting iron sights, check your front blade for tightness. If it is loose, it must be corrected and your rifle resighted.

When reassembling rifles such as a Winchester Model 70 with three guard screws, start from the center screw and work outward. On a two-screw system rifle, start with the front screw, snugging each a little at a time until the action is seated tightly. Also, check your sling swivel screws and the butt plate screws for rust and tightness. If you remove these items, seal the areas with a wood preservative. Dropping your rifle because of a pulled sling can turn a great hunt into a disaster.

If your rifle has a scope, check and tighten all mounting screws. A little "Loc-tite" on these ensures reliability, even in the magnum cannons many hunters insist on shooting today.

One last step and your rifle is ready to sight in. If the stock has a varnish

type finish, a quick coat of paste wax will do wonders for appearance and protection against moisture. If it is oiled, rub a couple of coats of tung oil into it and then wax. Moisture-proofing will retard warpage and prevent sight change.

After all of these efforts, you may not recognize your own firearm. Believe me, a trip to the range or nearby gravel pit will probably show quite an improvement in grouping. A couple of boxes of shells spent punching holes in targets is a sound investment. Bore sighting can save a lot of ammunition, as can shooting your first few rounds at about 25 yards to obtain an initial group pattern.

In some 30 years of marksmanship, I've seen shooters blow up tons of ammo, yet never bring their piece to a true zero. If you are shooting a bolt action, bore sighting is a simple, inexpensive process. If you tote an automatic, lever, or pump, I suggest you have your sight alignment checked with a bore scope by a gunsmith or at your local sporting goods shop. Do not rely on a bore scope without checking your rifle on a range. Bore scoping or sighting should place your shots on a 24" × 24" paper, for starters.

To bring your bolt action to a basic zero, carve a couple of notches in a sturdy cardboard box so you can set your rifle in a stable position. Postion a target, with a black bulls-eye about one inch in diameter, about 25 yards away. Now pull your bolt, sight through the bore, and adjust your rifle's sights until your cross hairs or front post are at dead zero, or as I prefer, at 6 o'clock. Most of today's high-powered rifles are at dead zero between 23 and 28 yards with a scope and 120 to 150 yards with iron sights and will place a bullet in a killing zone out to 150 or 300 yards, depending on the firearm.

You are now ready for a few rounds—fire at least a three-shot group from a padded rest at 25 yards. Once you have a good group at short range, move to 100 yards. If you are shooting with open or peep sights, your bullet impact will move on the target the same direction you move your rear sight. On a scoped rifle, left means the impact moves left. Always fire at least three shots to establish a group before you make a sight change. On scoped rifles, tap the scope lightly to stabilize the internal parts after making an adjustment. Each minute of sight change will move your bullet left, right, up, or down one inch per 100 yards of range. Check your sights or scope to see if they are graduated in ¼-, ½- or 1-minute clicks of gradation. If your sights are ¼-minute grads, it requires four clicks per inch at 100 yards; ½ minute—two clicks; one minute—one click per inch.

I enjoy target shooting and shoot a rifle only big enough for the game I intend to hunt. Some of the "cannons" hunters use today produce a disease called "flinchitis." Remember that flinching can cause a round aimed north to take off in an easterly direction—toward the neighboring county.

There is no substitute for time spent shooting. But if this is out, spend a few minutes cleaning the bore and checking and tightening each screw. One turn of a screwdriver or a half dozen strokes of a cleaning rod can mean the difference between success and failure in the field.

When you begin the sighting-in process, bore sighting will save time and ammunition. This can be done easily if you are shooting a bolt action rifle. First, carve a couple of notches in a sturdy cardboard box to form a rest for your rifle. Next, position a target with a 1-inch bulls-eye about 25 yards away. Then pull the bolt, sight through the bore, and center the bulls-eye; a wedge-shaped block under the box is handy for adjusting your elevation. Now adjust your elevation and windage knobs until you have an accurate sight picture centered on the bull. Fire at least a three-shot group from a padded rest at 25 yards. Place your rifle in the box again, pull the bolt, and align your bore with the bulls-eye. Keeping your bore centered exactly on the bull, adjust the windage and elevation knobs to center the cross hairs of your scope on the three-shot group. Your next group of shots should be in the bulls-eye, and you are now ready for final sight tuning at your desired range.

READERS RESPOND

Someone Beat You To It

Regarding the quote on the inside front cover of the July/August 1985 issue:

Had William R. Logan said to me on his first day in the superintendent's office in Glacier National Park, "It is the desire of my heart to make this park the most wonderful land in the world," I would have been sorely tempted to say, "Sorry, sir, but someone beat you to it. But let us try to keep it that way."—*Hank Rate; Corwin Springs, Mont.*

Lots of Words About Weeds

Weed control at the Ninepipe Wildlife Management Area was described well by Mike Aderhold in *Montana Outdoors.* There certainly was a weed problem there, caused by neglect by the department. The present "solution" is drastic, and has diminished wildlife habitat substantially.

It appears that the department has sacrificed about one-third of the sportsman's precious acres. Aderhold explained that the department permits farmers to treat the sportsman's land as if it were their own. Farmers are not expected to modify their practices in the slightest to benefit nesting pheasants or ducks, or other habitat needs.

Why has the department abandoned about 1,000 acres of land it should be managing in trust for the Montana sportsman? Is it an admission that the department is incapable of managing wildlife habitat and controlling weeds at the same time?

The big question is this: Is destruction of game bird habitat a short-run, crash program to deal with an emergency situation—after which wildlife management will become top priority—or is this the way it is going to be from now on? Sportsmen might accept a temporary loss of game birds as the price for politically necessary weed control, but they should not let their land be mismanaged indefinitely.—*James K. Brown; Missoula, Mont.*

* * * * *

The Ninepipe Wildlife Management Area was labeled "a model of weed control" in Mike Aderhold's recent article in *Montana Outdoors.* Good—but is it also a model of wildlife management?

Ninepipe was bought with sportsmen's license fees and devoted, I think, to waterfowl and pheasant management. Other land in the valley is intensively farmed and offers less wildlife habitat every year, making Ninepipe critically important for game birds. Much of the area, however, is also now intensively farmed, with huge fields plowed and barren during nesting season.

I have hunted birds at Ninepipe for nearly 20 years—good years and not-so-good years. In 1983, three of us with good dogs hunted north of the Charlo road on opening day. We bagged seven birds. In 1984, we hunted the same area. We finally left without firing a shot! Usually, opening day at Ninepipe sounds like a war; in 1984, one rarely heard a shot.

We thought perhaps opening day was a fluke and we returned several times, but birds were very scarce. The cause was not bad weather or some other general problem, because pheasant numbers on private land throughout the valley were only down slightly.

Ninepipe is precious, but there seems to be no wildlife management plan for the area. Without a guiding plan, the public cannot know what is intended, and actions such as weed control look haphazard and uncoordinated.

The Department of Fish, Wildlife and Parks could perform a great service by getting into game bird management throughout the valley. Ninepipe can't do it all, even with the best of management. Why not establish a special game bird management unit there and develop habitat through negotiating leases with landowners—a patch here, a few acres there—using fees from a special stamp required to hunt within the unit?

Unless something is done, pheasant hunting will diminish to nearly nothing. How will I explain to my grandsons why I can't take them out with the dog and introduce them to pheasant hunting? They are sure looking forward it.—*Robert C. Lucas; Missoula, Mont.*

* * * * *

It is generally a sorry mistake when politicians try to legislate management practices to the professional managers hired for the job. However, in the case of weed control at the Ninepipe Wildlife Management Area, as described in Mike Aderhold's article in the March/April issue, it must be applauded. It is too bad that management of an area like Ninepipe should be allowed to go downhill to the point that it takes action by the Legislature and concerned citizens to reverse the process.

Since the action by the Legislature stirred the Department of Fish, Wildlife and Parks to do something about the weeds on the area, will it also take action by the Legislature to achieve some professional wildlife (bird) management for the area? Not that the farmers are doing all that badly, for the Ninepipe area has about as many birds per acre as the surrounding areas in the valley. It just seems that the sportsmen who pay the bills deserve better.

According to Aderhold, after one year's effort at weed control by the department, the Ninepipe area is one of the best examples of weed control in the state.

It would seem, then, that after years and years of crowing counts, checking station data gathering, other studies, and having 3,000 prime acres to practice on, that the professional managers of the Department of Fish, Wildlife and Parks would be able to demonstrate the Ninepipe Wildlife Management Area as one of the best examples of wildlife management in the state.

As a bird hunter and interested citizen, I certainly hope so. —*John V. Puckett; Missoula, Mont.*

Owed to Glacier

We have been receiving *Montana Outdoors* for a number of years; I enjoyed the last issue (July/August 1985), especially the article about Glacier National Park.

The first time I saw Glacier was in 1947. When I got home, I wrote this poem. After reading the article, I looked for my poem, which I had almost forgotten about. Perhaps you might publish it:

Mountains! Mountains!

Mountains! Mountains! OH, so high,
Where the birds of freedom fly,
And the elk, the moose, the deer,
Live happily from year to year.

The beautiful lakes shimmering in the sun—
You haven't even yet begun
To see all there is to see
In this wonderful Glacier Park country.

Horseback trails along the mountainside,
Along these I love to ride.
Heaven's Peak looming way up in the sky,
And Little Chief Mountain is very near by.

In Glacier Park we can see it all—

The evergreens so straight and tall.
Fishing, hiking, along the streams
Is the answer to a tourist's dream.

Mountains! Mountains! OH, so high,
Where the cold, cold glaciers lie.
Not so often you can see
Glaciers anywhere else in this country.

OH! The beauty of all the falls,
And the wonder of those weeping walls,
The canyons, oh so deep and strange,
Old Mother Nature for us has this arranged.

From Logan Pass you can see it all,
The fog along the Garden Wall.
I love this park in our wonderful state,
Let's all try to see it before it's too late.

Close to heaven, it makes you seem.
The beautiful flowers are there to be seen.
I love their beauty so great and rare,
OH! Let's not forget to mention that big brown bear.

Mountains! Mountains! OH, so high,
Reaching up toward the sunny sky.
It's waiting there for all to see,
The beauty of our park country.

—Mrs. George R. Smith
Grassrange. Mont.

MO Backs Up Boast

As a Montanan, I'm proud of our state and *Montana Outdoors*. I am currently serving out of state with the Air Force, and when I share the beauty and richness of our state with friends, your magazine backs up my boasting.

Enclosed is a gift subscription for a special couple who live in another part of the world, but who came to enjoy your magazine through my wife and me. I would especially appreciate it if you would send them a copy of the Jan./Feb. 1985 Special Photo Issue.—*Steve Sem; Cedar Hill, Texas*

Letter from Deer Creek

The whole family enjoys your magazine very much. We were glad to see that the newest issue (July/August 1985) had caught our three-year renewal.

We spend from May until at least the end of October in the Gallatin Canyon at Deer Creek. With development of a trail head by the Forest Service, we have found both fish and grouse diminished, but that is to be expected with greater use of the trail into the Spanish Peaks Primitive Area, now called the Lee Metcalf Wilderness.

Possibly the trapping and removal of beaver in the 1950s began the decrease of trout. Reading your articles initiates a good deal of speculation about the whys and wherefores of animal distribution.

We wonder what clearing out our beetle-killed lodgepoles will do to the balance of nature. All the new growth is very small yet.—*Shirley L. Luhrsen; Gallatin Canyon at Deer Creek, Mont.*

Bluebird Society Offers Info

I enjoyed the article, "About Bluebirds," in the March/April 1985 issue of *Montana Outdoors*. Montana has been an active supporter of bluebird conservation and has provided a couple of members to the board of directors of the North American Bluebird Society, including current board member, Deni Hershberger of Plains.

Your readers might appreciate knowing that they can obtain information about bluebirds and box plans from: North American Bluebird Society, Inc., Box 6295; Silver Spring, MD 20906 (301/384-2798).—*Dave Pardoe, board of directors, North American Bluebird Society.*

Partners continued

The three of us got out. I broke the Beretta over and under, slipped in two loads of magnum sixes, and as always liked the solid businesslike sound of the breech clicking shut. I could hear the machined "snick" of Mike Murphy's 101 closing, and Aldrich's Browning autoloader chunking as he fed it the three big shells.

We moved forward.

No ducks. The little willowed strip of warm water was empty.

Smoking as we trudged back to the truck, Aldrich suggested, "Why don't we. . .?"

"Good idea." I tapped my pipe on my boot.

We drove toward the Pumphouse Hole.

"D'ja bring. . . ?"

"I knew I was forgetting something! We probably won't need them today anyway."

"Been nice to've had 'em along though. Shoot, that's all right. We can scrunch down in the tumbleweeds."

A single mallard got up far out over the Missouri, but nothing in the Pumphouse Hole either. It was okay; we only needed a few more, and it was a beautiful day.

We could hear Chance, Murphy's big black Lab, scratching a more comfortable bed in the unfamiliar dog box. He and Murph didn't usually hunt with us, but he liked the smell of the 15 mallards near the tailgate. Only two were hens.

I had the "Henny Penny" award for the day. The two hens had roared into our spread of magnum decoys just as Aldrich had stepped out of the blind. I'd gotten lucky, with the sun in my eyes, and they'd both come down. The first a whirly-winged splash in the slough, and the second, on the far bank, with the solid whumping bounce that spells stone dead.

Aldrich fired up the engine.

"Let's go up. . . ."

"Sounds good to me. We can probably get a couple more each, right at quitting time."

"Think they'll. . . ?"

"Nah. They were really wanting in last night."

Originally from southeastern Kansas myself, it always bothers me that Aldrich never drops any of the g's on the ends of his words. I guess they just enunciate better where he comes from in Wyoming.

"Might be a few. . . ."

"I was just thinking the same thing." He was squinting into the lowering sun. "They look like arrows after the mallards. I never remember how long their necks really are 'til I pick one up."

He parked the high-sprung rig in the little clump of trees.

We all shot well. Sure enough the pintails had lost their customary caution and poured into the shiny broken puddles in the flooded wheat field.

Chance pranced alongside as we each carried our two long-necked drakes back. Aldrich and Murph had finished up with picture-book doubles. I'd scratched down a couple of singles. Chance had been coming in and hadn't seen my last one fly far out and then plummet to the stubble in the next field.

It always amazed me to watch Murph send the big dog out on a long blind retrieve. The line was only slightly off. One tweet on the whistle stopped him cold at the right distance. One hand signal to the left and he had bounded back, a soft-mouthed shadow outlined in the gold of the setting sun.

"Just like that afternoon . . ." I started.

"Uh huh, but we shot a little better this time."

Murph kenneled Chance and hopped in. I cased the over and under and followed.

"I wonder . . ." Aldrich mused as we worked our way back to the main road.

"I don't know. Sure be fun to find out."

I could feel Murphy stirring between us.

"How long d'ya s'pose before. . . ?"

"Probably a couple of weeks anyway."

"DAMN!"

Murph's explosion took us both off guard.

"I just wish somebody'd say one complete sentence so I'd know what in the world this conversation's all about!"

We hadn't realized.

Partners just talk that way. ■

Teeth Provide Age, Other Info

Sportsmen and wildlife managers across the country are becoming involved with a process they can get their teeth into—or, to be more accurate, the teeth of the harvested game and furbearing animals. Analysis of teeth provides biologists with an efficient method for securing age and other information from the wildlife populations they are managing. Biologists use their knowledge about the average age of a population, or the number of animals in each age category, to make decisions concerning hunting seasons and other management options. Their goal is to keep wildlife populations vigorous.

Some states and Canadian provinces require hunters and trappers to submit the head, skull, jaw, or teeth of harvested animals to a wildlife agency for aging. Using just a few minutes of his time, the sportsman thus participates in the valuable but difficult process of managing the wildlife populations we all enjoy. Some states collect thousands of teeth in this way, thus providing valuable data in a short time. (In Montana, it is now mandatory to turn in the head or skull of a black bear; department personnel will remove the proper tooth. If you were unaware of the mandatory tooth turn-in, it's not too late to turn in the skull at any Fish, Wildlife and Parks regional office, or at the Helena headquarters.)

The age analysis process begins when the wildlife biologist sends teeth to the laboratory where each tooth is labeled for identification. Treatment with acid makes the tooth pliable by removing the calcium. A small piece of the softened tooth root is embedded in a block of paraffin. This is mounted on an instrument that cuts off a very thin slice. The precision slice, called a "section," is delicate, several times thinner than a human hair. Sections are mounted on glass microscope slides and stained with a dye. Stained cells and fibers of the tooth root are easily visible under the microscope because the section is so thin and evenly cut.

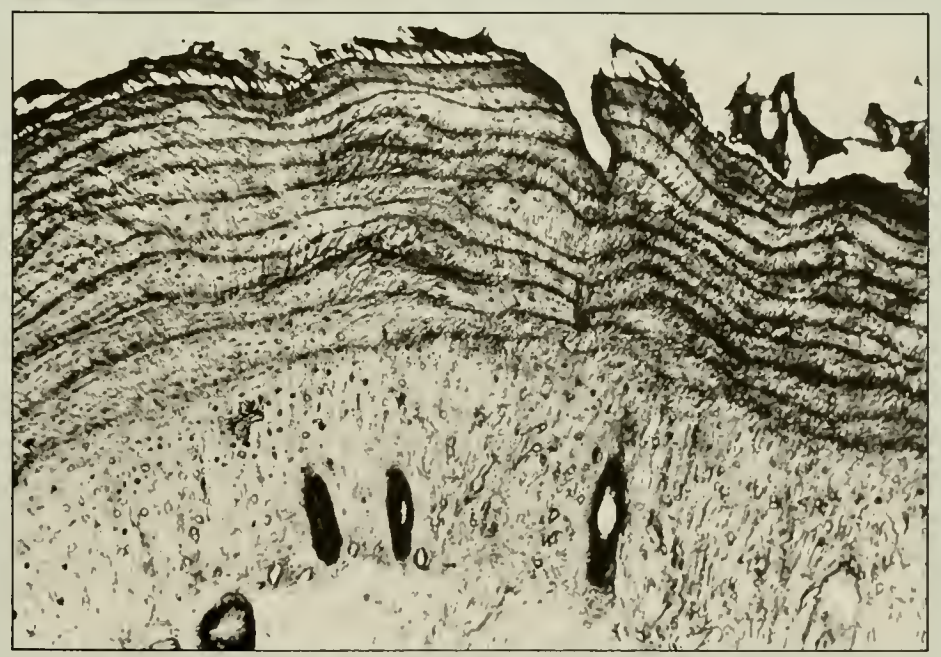
Microscopic study of the outer cementum portion of the tooth root section shows an alternating pattern of light and dark bands. The bands are present in the tooth root for the same reason there are rings in a tree. Tooth cementum grows throughout the life of an animal, and one light and one dark layer are added each year. By counting microscopically either the light or the dark cementum bands, researchers can determine age.

Some problems arise with cementum aging. Teeth with roots broken off during removal are of little value in age determination. When teeth are stored in plastic wrapping instead of a porous material like paper, the teeth rot. Sometimes, a species is not identified and it is impossible to make a correct age determination from the tooth because analysis methods are unique for each species. For example, a tooth identified only as a "deer" tooth may be incorrectly aged because the method for counting cementum bands is different for white-tailed deer than it is for mule deer.

A tooth root tip, marked with an identifying label, has been placed in a plastic capsule (above) for chemical processing. Two thin sections of root tip have been mounted on a glass slide (below) and stained for microscopic study.

Just why cementum aging works remains a mystery. In some species, the technique doesn't work very well; for others—human beings for example—it doesn't seem to work at all. But for deer, bear, elk, mountain goat, and many other species, it is extremely accurate. The underlying physiological principles are unknown, but hibernation, mating, antler growth, length of day, and other metabolic and environmental changes may play a role in formation of the annual growth bands.

Most wildlife management agencies have a procedure to provide the age of a harvested animal to the sportsman who contributes a tooth. (Black bear hunters in Montana who participate in the mandatory tooth turn-in will receive age information about their animal in spring of 1986.) Cooperating sportsmen are important partners in obtaining large amounts of data at relatively low cost. The field observations of each hunter and trapper, the basic investigators in this scientific endeavor, combined with the expertise of the laboratory technician and the management skills of the wildlife biologist can provide vigorous game populations for years to come.—*Gary and Judy Matson, Commercial Microtechnique; Milltown, Mont.*



Ten dark bands are visible in this section of root tip. The photograph was taken through a microscope, and it is magnified 60 times.

CONTRIBUTORS

• **Ron Jenkins**' painting, "Gypsy," captures the color, energy, and spirit of an autumn day afield in pursuit of pheasants. The painting, commissioned by Dr. Richard Dewey of Missoula, was presented to his wife Heidemarie as a surprise birthday gift; Gypsy was a springer spaniel belonging to the Dewey family. *Montana Outdoors* thanks the Deweys for allowing us to photograph the painting for use with Editor Dave Books' article, "Opening Day," beginning on page 2. Jenkins' work has appeared in our pages many times, including the paintings that accompanied the "Identification of Montana's Upland Game Birds" (Sept./Oct. 1982). His work has been exhibited all over the country, and his illustrations have appeared in many magazines. The Missoula artist believes in viewing his subjects in their natural habitat, and his strong feelings for things wild are evident in his work.

• "Outfitters—Do You Need One?" It's a question many outdoor recreationists ask themselves as they contemplate a trip into Montana's backcountry. **Jim Zumbo** looks at the pros and cons, and suggests ways to secure a reputable outfitter, should you decide that's the best course for you. Zumbo is editor-at-large for *Outdoor Life;* his new book, "Hunt Elk" (Winchester Press) will be available early this fall. For information about autographed copies, contact him at: P. O. Box 2390; Cody, WY 82414. Turn to his article on page 4.

• The "Perspectives" series continues with **Ed Merritt**'s description of opening day at "The Pipes"—the Ninepipe National Wildlife Refuge and Wildlife Management Area. Merritt notes that things have changed over the last few years and "those changes have been, without exception, for the better." The reason? Cooperation between state and federal conservation agencies and sportsmen. Merritt is assistant manager of the Alamosa/Monte Vista National Wildlife Refuge in Alamosa, Colo.; he previously was assistant manager at the National Bison Range, Moiese, Mont. His article begins on page 7.

Jan Bonham Metzmaker's pen and ink rendition of a Canada goose illustrates "Perspectives." She has worked for the National Park Service in Glacier National Park and the Lolo National Forest. She operates a card and calendar business featuring drawings of Glacier's wildlife. Her work can be seen by appointment: 716 Edgewood; Whitefish, MT 59937 (406/862-7960). Her pen and ink of an eagle also accompanies "Fall in the Flathead: Kokanee and Eagles."

• "Choosing a Youngster's First Gun" could be a more important decision than you realize. Through experiences with these first guns, children come to enjoy—or not enjoy—the shooting sports. **R.E. "Bob" Fears, Jr.** provides some ideas on gun selection that he has formed from years of experience in the field, on the range, and in the classroom. Fears has been a Montana Hunter Safety Instructor since 1976, and he is the chief instructor for Yellowstone County (Billings). His article begins on page 8.

Illustration for Fears' article was prepared especially for this issue by **Diane Nugent**, Butte. A free-lance commercial artist, she has also entered shows with her watercolors, pen and inks, and combination pressed flowers and watercolors. Her work is available through the Robin's Nest and Arts Chateau, Butte; Copper Village, Anaconda; and the Tatem House, Helena.

• A cooperative study begun in 1981 is the first intensive work on moose in northern Montana and one of the few in the Pacific Northwest. As **Randy Matchett** writes, "The wide variety of habitats, current logging activity, the presence of a well-established moose population, and the importance of moose to Montana sportsmen made the Yaak River drainage an excellent place to study moose." "Bull of the Woods" begins on page 15. Matchett, who lives in Missoula, is a district field assistant for the U.S. Fish and Wildlife Service. This article was based on his master's thesis.

• "Partners" are like husbands and wives. There's much they don't need to say—and many sentences that can be left unfinished. The other person just *knows* what you mean. Turn to another **Mike Logan** jewel, on page 19. Logan teaches at Helena High School and his work—both photographs and articles—appears often in *MO.*

• If you follow the instructions in "Tune In and Tune Up" (page 20), even a neglected firearm can be made to hum. **Merlin L. Smart** provides some step-by-step instructions—further explained by **Mike Aderhold**'s photographs. From his Kalispell home, Smart operates Artistry in Wood; he makes gun stocks, toys, and lamp and clock bases. He has been a hunter safety instructor in Oregon and Montana since 1955. Aderhold is the department's information officer in Kalispell.

• How do you go about "Adopting a Wilderness"? Turn to page 27, and **Bill Sager** will tell you about a natural history class at Ronan High School that has "adopted" the Mission Mountains. Students in Jim Thormahlen's class have carried out trash, cleaned up trails and campsites, built primitive bridges—and learned a new respect for wilderness and the natural resources it sustains. Sager is a free-lance writer and photographer living in Ronan. He is the former editor of the Ronan Pioneer, and was a reporter on the Ravalli Republic in Hamilton.

• We think readers will enjoy **Paul Schullery**'s "Jumping Water." It's a captivating piece, taken from his book, "Mountain Time" (Nick Lyons Books, 31 W. 21st St.; New York, NY 10010). The title comes from the last sentence of the essay: "Like the satisfaction of looking at a mountain range that you know has grizzly bears, there is much to be said for a good look at a wild river, and I always look with special joy at the jumping water, even when the foam is empty of trout." Schullery lives in Livingston; he has written, co-authored, or edited nine books. "Jumping Water" takes off on page 31.

• If you're one of Montana's 50,000 bird hunters, you know "The First Saturday After Labor Day" is when grouse seasons finally open. Many of these same bird hunters have noticed that season length and bag limits have become more standardized in recent years. **C. Robert Watts** and **Frank G. Feist** ask, "Are these uniform, seemingly 'liberal' seasons a sound way to manage this unique and valuable resource?" The answer is affirmative; turn to it on page 34. Wildlife biologists for the department, Watts works in Lewistown and Feist in Great Falls.

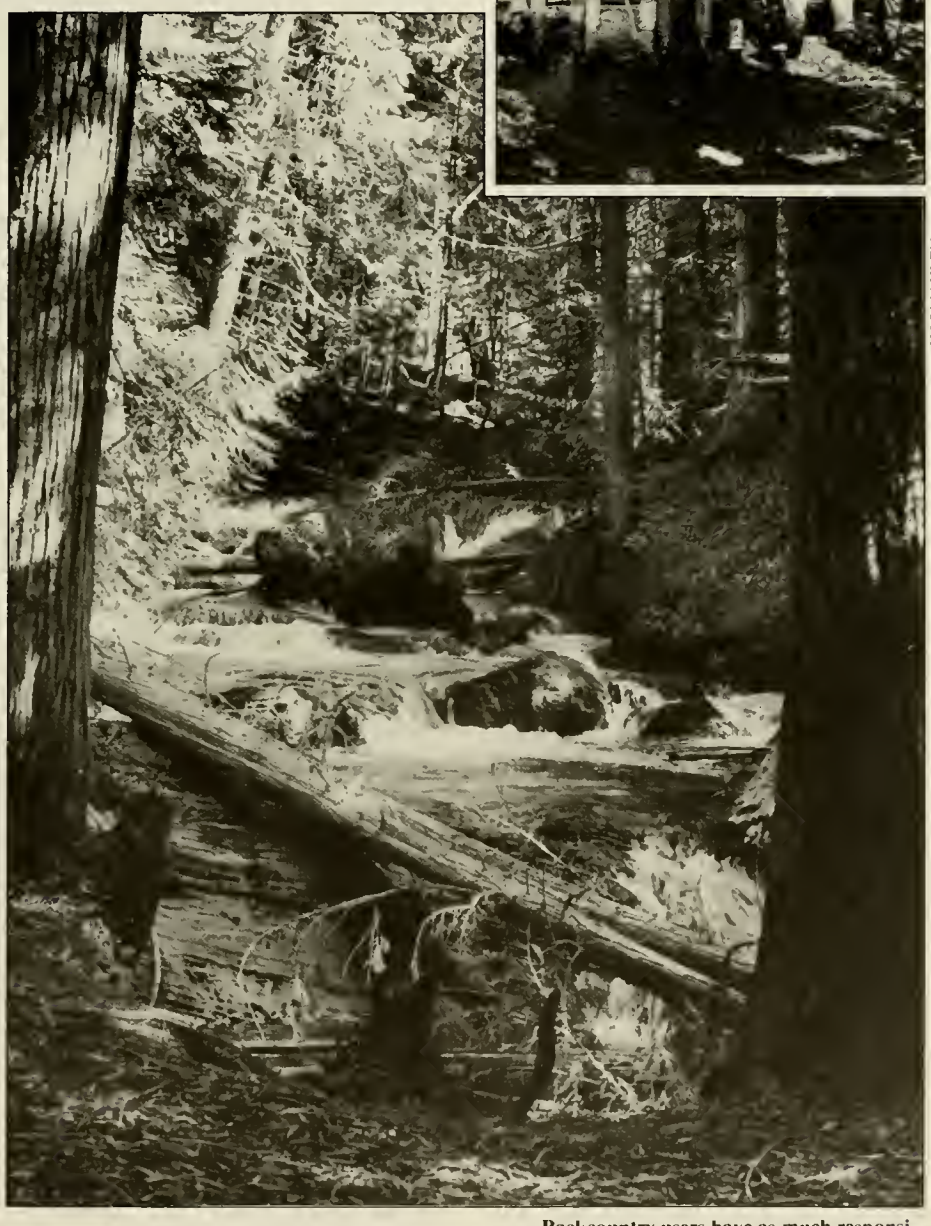
The field studies of sage and sharp-tailed grouse that illustrate the article were prepared especially for this issue by Great Falls artist **Dave Maloney.** He has won national and international awards for his work, including recognition from such well-known shows as the National Ducks Unlimited Wildlife Show in Kansas City. Because his 1984 Federal Duck Stamp entry was among the top entries, it was selected for the Federal Migratory and Bird Hunting Conservation Stamp Exhibit in California. He works from his studio/home in Great Falls: 704 Grizzly Drive; Great Falls, MT 59404 (406/452-9605).

• Special thanks to the following photographers: **Len Fabich,** Anaconda; **Michael H. Francis** and **Ron Shade,** Yellowstone National Park, Wyo.; **Rocky Hoffmann,** North Platte, Neb.; **Conrad Rowe,** Great Falls; and **Steve Wirt,** Whitefish.

ADOPTING A WILDERNESS

by Bill Sager

JIM THORMAHLEN



JIM THORMAHLEN

People expressing concern about the way resource management agencies handle a specific problem is nothing new. Channeling energy sparked by that concern into commitment to help find a solution to that particular problem is relatively rare.

Ronan High School science teacher Jim Thormahlen and his wife Nancy are two who chose to commit themselves to doing something about a problem. In 1978, the Thormahlens were hiking in the Sawtooths in Idaho. "As we hiked along," Thormahlen said, "I became aware of how clean the area was. When I compared the cleanliness of the Sawtooths with the litter and garbage dumps in the Missions, I wanted to do something about the problem." They decided that they, as backcountry users, had as much responsibility to help keep the wilderness clean as those agencies assigned that duty.

When they returned to Ronan, Thormahlen shared his concerns about the situation in the Missions with his Montana natural history class. After a discussion of the problem and the responsibilities of those who use wilderness areas, the class elected to "adopt" the Mission Mountains.

To anyone who lives in Ronan or elsewhere in the Mission Valley, the Mission Mountains are a dominant feature. To the east, the peaks rise 7,000 feet above the valley floor. They block the early morning sun, influence the weather, and have a major effect on those who live in their shadow. The rugged, snow-capped peaks, small glaciers, alpine lakes, meadows, and miles of cold mountain streams have provided both retreat and challenge since man first arrived in the valley.

After moving to the Mission Valley in 1976, the Thormahlens hiked trails on both sides of the range, becoming

Backcountry users have as much responsibility to help keep the wilderness clean as those agencies assigned that duty. After a discussion of the problem and the responsibilities of those who use wilderness areas, the Ronan High School Montana natural history class "adopted" the Mission Mountains—with the goal of minimizing the growing problem of human impact.

familiar with the country and the growing problem of human impact. "The human impact problem isn't unique to the Mission Mountains Wilderness," Thormahlen said recently. "Wilderness areas all over the country are being loved to death. Agencies delegated the responsibility of caring for the wilderness have been handicapped by lack of financing and understaffing. In the case of the Missions, the Tribal Wildland Recreation Department is responsible for the western half of the wilderness and the U.S. Forest Service (USFS) the eastern half. Neither can keep up with the increasing use and resulting impact."

Thormahlen designed and continues to refine a lesson plan that his natural history classes have followed over the last eight years. The class was originally designed to familiarize juniors and seniors with the geography, geology, flora, and fauna of Montana. The class also emphasizes and teaches students about different kinds of low-impact recreation. The concept of "adopting" a specific wilderness site and working to improve it was easily included in the lesson plan.

Thormahlen has excellent qualifications for designing a lesson plan that combines classroom work with field activities. He holds a bachelor's degree in biological conservation and teaches science, physics, earth science, and chemistry, in addition to the natural history class. He has worked 12 summers for the USFS and one summer for the California Department of Parks and Recreation. He has been a fire fighter, fire lookout, trail crew foreman, wilderness patrolman, and has worked at the Forest Service Equipment Development Center in California.

Only a few students were involved in the first class project in 1978. They hiked into Mollman Lake, just east of the Continental Divide, to pick up trash and break up fire rings. Over the next seven years, participation in the "Adopt a Wilderness" program has grown to include the high school Cross-Country Ski and Mountaineering Club. "The club was included as an 'official adopter' so that freshmen and sophomores could be in the program. We wanted to begin teaching outdoor skills to younger students," Thormahlen explained.

Participants in the program have included exchange students from Finland, Sweden, and Australia; teachers and principals from the Ronan school system; teachers from other schools; and volunteers from the community. A number of former students have returned from college to make the trips into the Missions.

Students combine classroom work with the field trips as they learn to identify birds, mammals, and edible plants, and as they learn general ecological principles and aspects of animal behavior. In addition to the fall hiking trips, the Cross-Country Ski and Mountain-

JIM THORMAHLEN

JIM THORMAHLEN

As part of learning about Montana's natural history, Jim Thormahlen's Ronan High School class has carried hundreds of pounds of trash out of the Mission Mountains in backpacks, planted grass, built primitive bridges, cleaned camping areas, and maintained trails. In the process, a new generation has come to recognize and respect wilderness and the natural resources it contains.

eering Club usually makes a four-day snow camping trip into the mountains near the end of March. To round out their outdoor skills, the students study orienteering. Water safety is incorporated into a canoe trip on Flathead Lake in the spring. There is also an annual whitewater raft trip on the Flathead River just after school begins in the fall.

Students in each Montana natural history class have retained the original enthusiasm for maintaining the adopted wilderness. The students have worked on projects on both sides of the divide, but over the past few years, more work has been done in the tribal wilderness because of its nearness to Ronan.

The Confederated Salish and Kootenai Tribes have the nation's only designated wilderness area managed for wilderness values on an Indian reservation. The Tribal Wilderness Management Plan parallels and even includes language from the Wilderness Act of 1964. The tribal plan specifically excludes significant parts of the act and emphasizes other parts to reflect the economic and cultural needs of the tribes. Recreation activities in the tribal wilderness are open to all; visitors are required to have a $10 recreation use permit, and the only restriction is that non-tribal members cannot hunt.

In 1979, the Tribal Council voted to establish a Mission Mountains Tribal Wilderness; actual designation came in 1982. The 89,500-acre Mission Mountains Tribal Wilderness is approximately 40 miles long and varies from six to 10 miles wide. The northern boundary lies about one-half mile south of Hell Roaring Creek. The western boundary runs south between the 4,000- and 5,000-foot contour along the slope of the mountains to the North Fork of the Jocko River. It continues up the North Fork to a small divide where it crosses to the Middle Fork and continues up to the summit. The crest of the divide is the boundary with the 73,877-acre Mission Mountains Wilderness Area on the east slope. This USFS-administered wilderness was designated under the 1964 Wilderness Act.

In addition to its scenic beauty, the Mission Mountains Wilderness is home to a wide variety of wildlife. It provides prime habitat for grizzly and black bear, deer, elk, and mountain goat, and harbors some less common species like the lynx, wolverine, mountain lion, and fisher. Westslope cutthroat, rainbow, brook, and golden trout inhabit the lakes and streams. There are 12 major trail heads on the western slopes, leading to approximately 120 miles of trails. Most campsites are near lakes.

The Tribal Wildland Recreation Department manages tribal wilderness along with non-wilderness recreation resources on the Flathead Reservation. Department Director Herschel Mays said his staff includes Fred Matt, project work coordinator, and four summer employees. The Kicking Horse Job Corps and Bureau of Indian Affairs (BIA) fire crew also provide support.

Concerning the class that "adopted" the Missions, Mays said, "I consider the Ronan High School class as a support force that is a definite benefit when it comes to management. The actual work is appreciated. Figuring the man-hours spent collecting litter and building bridges, the students provide an economic gain."

Mays also recognizes another aspect of the students' work. "The program is educating a new generation of people to recognize and respect the tribal wilderness and its natural resources. That exposure is important," he said.

Both the USFS and the tribes have provided tools for the class projects and the tribes have also contributed backpacking equipment for the students to use.

Class projects have included the cleanup of Mollman, Gray Wolf, and Cedar lakes on the east side of the divide. In the tribal wilderness, students have worked at Ashley, Terrace, Summit, Whelp, Lost Sheep, Riddell, Round, Buck, and South Crow lakes. They have also cleaned up campsites in North Crow Canyon and Buck Creek and Hell Roaring Pass cabin. Students have carried hundreds of pounds of trash out of the wilderness in their backpacks. The class has also maintained Eagle Pass Trail and the trail from McDonald Lake to Summit Lake.

Last September, the lesson plan called for planting grass at Summit Lake. Snow prevented students from planting the seeds, but they built three primitive bridges, cleaned four camp areas, packed out trash, and maintained the trail along the way.

Mays accompanied the group on the September trip. He noted, "In keeping with the wilderness concept, the bridges consist only of flattened logs placed across streams that present a definite hazard. There are no planks or guard rails. We are concerned with keeping everything primitive." All work was done with hand tools because power tools are not permitted in the wilderness. Even though the students came out with several backpack loads of trash on that trip, Mays said that over the past two years litter has seemed to be less of a problem. "I think the reduced litter is the result of involvement by young people who have become more aware of the wilderness and its values."

The dedication, skills, and philosophy of students in the Ronan High School Montana natural history class and the Cross-Country Ski and Mountaineering Club have received recognition beyond the Mission Valley. In 1983, The Nature Conservancy selected the young people as interim managers of its recently acquired 160-acre tract surrounding Swartz Lake. The tract is southeast of Ronan, just outside the tribal wilderness. (The Nature Conservancy is a national nonprofit organization devoting its resources to protection of ecologically significant areas and the diversity of life they support.)

The organization is searching for a group with ecological goals similar to those of the conservancy to purchase and manage the area. In the meantime, the Ronan students have removed trash and established ongoing maintenance and restoration projects. So lakeside vegetation can recover and provide habitat more suitable for wildlife, vehicles have been excluded from the area. The Nature Conservancy gives first priority to preserving areas that safeguard critical ecosystems or have an endangered species. Jim Claar, BIA wildlife biologist, classifies Swartz Lake as prime grizzly bear habitat.

A project that began small has grown. As each new class of students leaves and goes on to do other things, the knowledge they have acquired goes with them. "Adopt a Wilderness" works—because two people saw a problem, and came up with a way to chip away at its solution. ■

Could this photograph have been taken 100 years ago?

Some hundred years ago, capturing a group of pronghorn antelope on film would have been a difficult challenge . . . but not for the reason you might think.

Back then, the problem was not with the camera, but with the subject. *Around the turn of the century, there were very few pronghorn left to photograph and their numbers were declining.* Once rivaling the buffalo as the most numerous of the prairie large animal species, the rapid settlement of the West had reduced the pronghorn population to about 13,000.

Fortunately, the efforts of our state and federal wildlife agencies began before it was too late. Over the years, they've set aside millions of acres of prime habitat and returned herds to suitable areas through transplant programs.

Most of the money for these programs has come from American sportsmen, through license fees and special taxes on equipment.

The result? Once threatened to the point of extinction, there are now over 750,000 pronghorn in the western states.

National Shooting Sports Foundation
NSSF P.O. Box 1075
Riverside, Conn. 06878

Photo by Leonard Lee Rue III

PAUL SCHULLERY

Jumping Water

by Paul Schullery

The soft inner walls of the lower Gardner River, as often dried mudflow as sandstone, are constantly sloughing off, like some patient earthen glacier pouring from the mountain above. Like the whole west face of Mt. Everts, the walls of the inner canyon are a cavalcade of gullies, gravel slides, and dirt piles. The jumble is so confusing that you can best appreciate what's happening—how the river keeps clearing the slipping debris from its path—from a distance. When seen from high on the slopes of Sepulchre, across from Everts, the Gardner's course makes more sense; the great ridged face of Everts is pantomimed in miniature by the Gardner canyon walls at its feet.

Here and there in the inner canyon, harder crests of stone have been left jutting free from the receding dirt walls. One such prominence, Eagle Nest Rock, used to host an osprey pair; what is left of their nest, weathered silver and battered apart, still tops the tower like an unruly wig. One day while fishing in the canyon I saw an osprey alight there as if checking out the neighborhood. For a moment I had hope that they'd return to the rock after many years of absence, but the bird rested only briefly, then flew away. I don't know why they don't return—I've heard they left years ago after a wrecked tank truck poisoned the fish in that stretch of river—but it could be heavier traffic than in earlier days, or too many photographers. For whatever reason, the big nest

Reprinted from "Mountain Time" by Paul Schullery, by permission of Nick Lyons Books, 31 W. 21st St.; New York, NY 10010.

remains an empty home.

Bighorn sheep move into the canyon in late fall, spending part of their time grazing up above in the open on McMinn Bench and the rest along the steep walls of the canyon. They stay there until early spring, some of the ewes not leaving until after lambing time.

So close to the road, so easily approached, these sheep seem almost unreal, and even disappointing. More than any other North American grazer except the mountain goat, bighorns have a reputation for living in places only they can go. Hunters have been writing about the extraordinary challenge of sheep-hunting for more than a century. Having a band of bighorns walk in front of your car is great, but it also seems too easy. I want to object that sheep, like bears, should be earned.

The canyon—indeed, the whole north end of the park in winter—attracts wildlife photographers in greater numbers than sheep. Stunning photographs with rugged, breathtaking backdrops can be had from a car window or, at best, an easy climb. I've seen any number of such photographs in magazines, recognizing the familiar background of north Yellowstone's scenery. The magazine's readers admire what difficulties must have been overcome to reach such a magnificent subject in such a wonderful setting. I've taken similar pictures, getting so close that through my zoom lens the nervously alert brown eyes of a restless ewe shamed me for disturbing these harassed gentle creatures.

Perhaps it's because the big animals are so easy to see when I live here, or maybe it's because I actually have become as open-minded about wildlife appreciation as I want to, but there are other, less glamorous animals that usually distract me from the sheep. For me, the center ring for the wildlife show in the canyon is down in the river, and hardly anyone knows it. While the tourists and professional photographers line the roads watching the sheep, deer, and elk, I take myself to the slick rocks below a dark pool I know, lone witness to a silent miracle in the river.

The Gardner serves the Yellowstone River as a major nursery stream. Each fall Yellowstone River browns migrate up the Gardner and other feeders to spawn. Like so many miniature imitations of their salmon cousins, they crowd nervously from the depth, space, and security of the big river into the Gardner's shallow pools and riffles, returning, as near as we know, to the natal ground—to the very gravel beds from which they themselves were hatched years before.

I first encountered this spawning run on the closing day of trout season the first year I stayed in the park through the winter. I was fishing about a mile above the Gardner's mouth at the Yellowstone, working a weighted imitation stonefly nymph through a deep trough of slow water below a small cascade. The water was full of unhookable fish; they would strike savagely, but quickly slip from the hook before I could even identify them. I didn't know larger fish were in the river, had not imagined that the pool was any different from the week before, and hadn't yet noticed the faded clipping in the storehouse at Mammoth that showed the nine-pounder that Ed Wolfe had caught a few years earlier upstream from where I was.

So I was totally unprepared when on a long downstream swing my fly came to a stop in midcurrent. I had sense enough to set the hook, but there my involvement in the action ceased. A brown trout larger than any I had ever seen immediately had my attention.

Mark Twain once observed that a man who carries a cat home by the tail will learn a hundred times as much as a man who carries it otherwise. During my brief attachment to this trout I learned much of practical value about the vigor, energy, and fabulous acrobatic abandon that the adult brown trout brings to its mating bed. Within 10 seconds the fish was airborne—high arcing leaps—at least six times. It still seems impossible, as if it bounced from the surface of the water as from a trampoline rather than submerging and getting a good purchase on the water between each leap. It was not a true giant trout by local standards. I reckon it now, with the cooler eye of experience, at upwards of 20 inches, hardly three pounds. But in the confines of this small pool, the fish jumping insanely almost within reach of my rod tip, it was paralyzingly large. I was stunned, and just watched.

Actually, even had I been clearheaded and prepared, there would have been nothing for me to do. According to the books, I should have been ready to "give line" from the reel, to fight the fish with the forgiving bend of the rod, to wear the fish out. None of this seemed to apply. The fish wanted no line; the 30 or so feet he had gave him ample freedom, especially as he chose to jump and run upstream, toward me. With him spending more time in the air than in the water, and hardly any time at all in any given place, it would have taken a much better angler than I to organize anything resembling a fight.

It didn't matter. On the last jump he threw the fly. The shattered surface of the pool ran out into the next run, washing my line ashore and leaving me giggling quietly.

A little checking around brought uneven information. Yes, this happens every year, but the run usually doesn't come in until after the season is closed, and some years there don't seem to be very many fish. No, it hasn't been studied much by the biologists but we do know that the Gardner is a damned important nursery for the Yellowstone browns. Yes, people catch big ones off the mouth of the Gardner, in the Yellowstone itself—look at those monsters hanging behind the bar down at the Town Cafe. Yes, locals do poach the devil out of the run sometimes. No, it isn't reliable enough to attract fishermen the way the runs on the Madison do; the fish aren't big or numerous enough even when the run does occur before the season closes. But it is kind of fun to go watch them jump in the cartwheel.

The cartwheel?

Yeah, you know, that chute of white water below that turn in the road in the canyon that gets bad when it's icy?

Yes?

Well, the trout have a hard time getting through that up to the spawning beds at Chinaman's Garden. They gather in that pool below the chute, everybody calls it the cartwheel, and every so often one will take a running start and pitch itself ass over teakettle into the fast water. Big long jumps.

I'm on my way.

In recent years the stretch of river containing the cartwheel has been closed to fishing well before the rest of the river, to protect early spawners and to foil meat fishermen who use sport gear to snag the vulnerable trout. By the time the fish start coming in, the river is without human visitors and I usually have the cartwheel to myself.

I drive by and pull over to where I can look down the bank to the white water. If I see no jumpers in five minutes or so I don't hang around. At peak times there may be a jumper

every 20 seconds, and if I see one or two jump fairly quickly I'll stop the engine and climb down to the rocks.

At low water, in late fall, the cartwheel is mostly confined to a rock chute about 12 feet wide with large flat shelves right up to its edge. The shelves have an inch or two of water flowing across them, but practically the whole river is gathered above the chute in a rocky defile and pushed wildly into the narrow cut, where it churns and foams down, more a torrent than a current. The chute empties into a tight, deep hole of the darkest water on the river, stirs there momentarily, then plunges on down through a series of stair-step rapids. The Gardner in its canyon is a high-energy river.

For me, the center ring for the wildlife show in the canyon is down in the river, and hardly anyone knows it. . . . I take myself to the slick rocks below a dark pool I know, lone witness to a silent miracle in the river.

The dark pool serves as a staging area for upstream migrants. When the run is on, they gather in this swirling little cauldron of rocks, taking turns at the cartwheel. Sometimes, standing right at the brink of the rock ledge, I've looked down and seen a big roiling ball of brown trout—dozens, at least, 10 to 16 inches—being churned around like a tangled wad of earthworms in the quieter side of the pool. The ball seemed to drift in and out from the ledge, sometimes partly obscured by the bubbles and foam from the cartwheel, sometimes sinking deeper until it was lost to sight. From it came the jumpers.

On the West Coast I've seen the big salmon jumping; it's fast, but the size of the fish makes the process observably graceful. A 30-pounder emerges from the water in a smooth arc, shedding water from its sides as it climbs into the air. Some jumps seem almost ponderous. Not so with the trout here in the cartwheel; all is flashing speed. One at a time, the trout get a short running start below the chute and emerge from the foam somewhere near the lower end. As they shoot clear of the water, their tails often flutter, too fast to see, as if they seek a hold on the air to match the one they used to launch themselves from the water. More disconcerting than the frenetically kicking tail is their seeming abandonment of normal orientation. They do go ass over teakettle, as if they were being thrown by someone. Here comes one sideways, spinning slowly, nose-over. Here's one upside down, followed by one curled like a horseshoe. Then, a traditionalist, in a classic headfirst leap as good as any fishing magazine cover artwork.

Obviously, considering their flight plans, they land with varying fortunes. The chute is fierce, and most seem to be washed back down the instant they hit the upper end of it. In all my watching I never saw a fish make it, though I know some do. Some smack wetly, still buzzing their tails, onto the rocks at the edge of the chute (a biologist friend tells me that migrating trout in other places have been known to throw themselves against unpassable dams until their heads split open). Others land in the shallow, racing little sheets of water that cover some of the ledge. When one finds this water, truly furious swimming can carry the day, for the ledge leads along the side of the chute clear up to calmer water. Once, watching with a friend, we found ourselves cheering these ledge-swimmers on. We stood on a dry rock only a couple of feet away, crouched over, yelling absurdly at a trout as it swam frantically in three inches of water (like a swimming coach running alongside the pool to exhort an athlete to keep pushing). When the trout gave up and was washed limply back into the chute, we would let out an "awww . . ." like fans watching a golf ball come to rest on the lip of the cup.

The admiration I'd gained from hooking one of these trout was nothing compared to what I came to feel at the jumping water. If I ever in my life show such intense single-minded devotion to a goal, even one as simple as procreation, I will die satisfied. The trout simply *had* to move up. They had to get through the cartwheel.

What makes this most wondrous is where they were going: the very gravel bed they, each individual to its own, had hatched from years before. In early winter I'd make my way to two or three favored spots on the river, choosing a fairly windless day if I could (it's hard to see through a ruffled surface). Watching some of the larger gravel bars, where the water was only a foot or two deep, I might count 30 fish finning quietly or jockeying for position: osprey heaven. Light spots would appear on the gravel—oblongs two feet in length—where females had dug shallow depressions by turning sideways and rapidly fanning the dirt and stones out with their tails. Eventually, with one or more males in attendance, the female laid her eggs into the depression, the male ejecting his milt in a fine settling fog at the same time. The process would be repeated until the females were out of eggs, and after a while (later in the winter, I think) the trout would drift back down to the bigger river, leaving behind only the resident trout who would dine heartily on the hatchlings (their own included) a few weeks later.

A friend and I wrote a book called "Freshwater Wilderness," devoted to Yellowstone's fish. The book was a kind of equal-rights statement for fish, in which we tried to get people to think of fish as wild animals—as wildlife. Our point was that it's too bad that more people don't open up to the excitement of the aquatic wilderness; it's a great show and you don't have to fish to enjoy it. Even in hard winter, with no thoughts of fishing, I often find myself drawn to the river.

In fact, even when the spawners have left the beds and only an occasional fish is to be seen, and when the cliffs are crawling with bighorns and the willow with deer, my attention keeps coming back to those dark currents whose ephemeral inhabitants overcome objects like none I can imagine facing. I drive down to a parking place I know and walk the paths a little more, and as I head back to the car, kicking through drifts where in summer I would be hip-deep in sage, and as I drive back up to Mammoth, I watch the water at every opportunity. Over the years I've learned every spot on the road that gives me a glimpse of the river, and how long I dare take my eyes from the road at each one. Like the satisfaction of looking at a mountain range that you know has grizzly bears, there is much to be said for a good look at a wild river, and I always look with special joy at the jumping water, even when the foam is empty of trout. ■

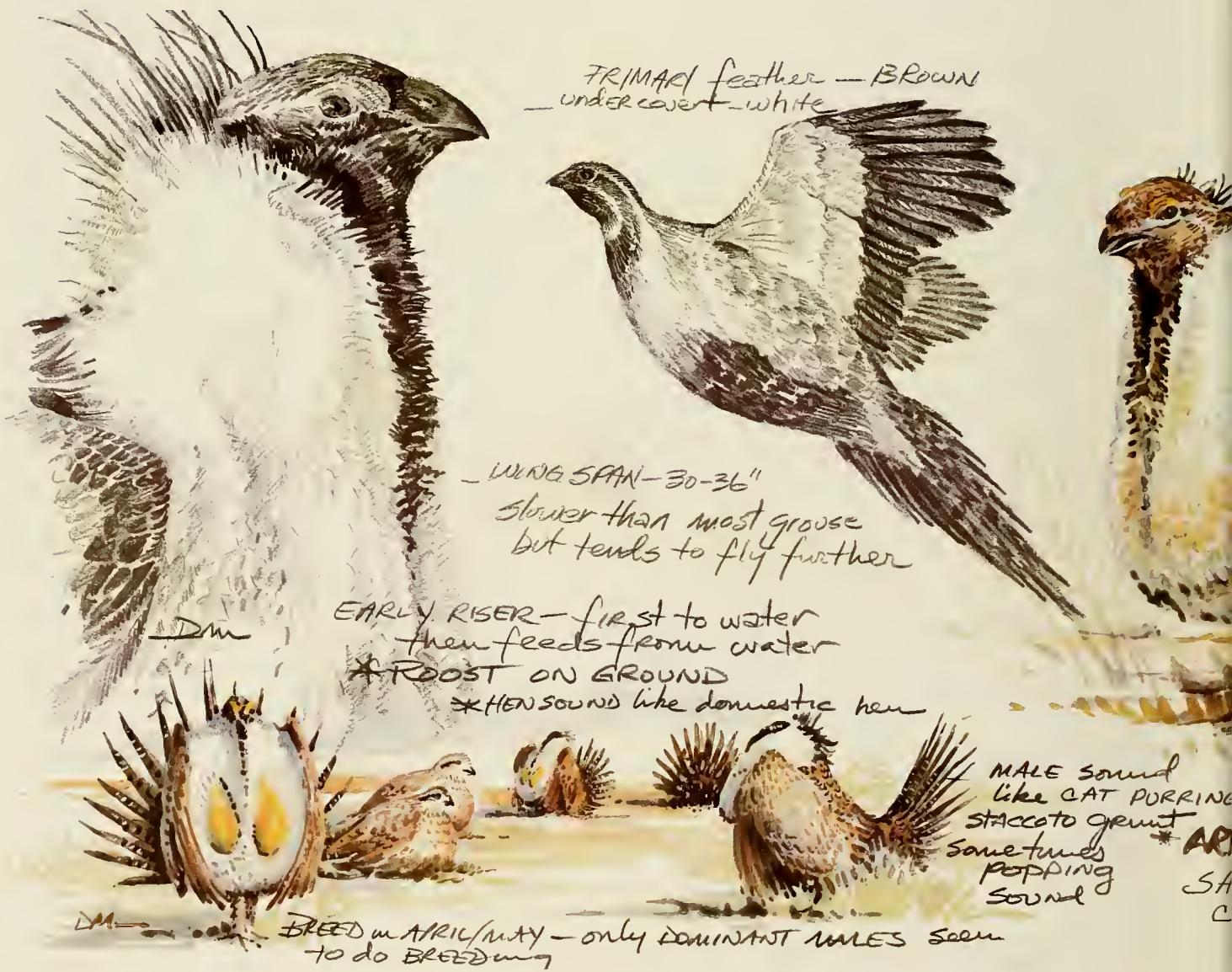
The First Saturday After Labor Day

by C. Robert Watts and Frank G. Feist
illustrated by Dave Maloney

What's so important about Sept. 7? Well, it just happens to be the first Saturday after Labor Day, and to Montana's 50,000 bird hunters that means only one thing: The grouse seasons are finally open. As a matter of fact, the grouse seasons, almost without exception, have opened on the first Saturday after Labor Day since 1969.

Many of these same bird hunters have noticed that the season length and even bag limits have become more standardized in recent years. Are these uniform, seemingly "liberal" seasons a sound way to manage this unique and valuable resource?

An analysis of prairie grouse (sharptail and sage) data gathered annually since 1955 answers this question in the affirmative. These data—obtained each year by counting male grouse on dancing grounds in the spring, collecting wings from hunter-harvested birds in the fall, and surveying hunters to determine fall harvest—provide useful insights into the long-range "health" of our prairie grouse populations. As this continuing effort to monitor prairie grouse populations proceeds, hunting regulations are modified



accordingly.

Grouse Productivity

For many of Montana's wildlife biologists, spring on the prairie means counting male sage and sharp-tailed grouse on their breeding grounds or "leks." Because breeding activity begins before dawn and subsides shortly after sunrise, a biologist's schedule begins at 3 a.m. during much of the spring.

These leks, some with a known history of annual use dating back more than 50 years, are occupied by the males of each species beginning with good weather in February and continuing on calm mornings until mid-June. Each male claims his own piece of ground (territory) upon which no other males are tolerated. The larger breeding grounds may have as many as 75 male sharptails or 150 male sage grouse. In Montana's better prairie grouse habitat, sharptail leks are typically spaced about every 1.5 miles, and sage grouse leks about every three miles. The females, which outnumber the males almost two to one, come to leks for a short time in April. Typically the females congregate within the territories of only one or two males, and these birds are responsible for all the matings. Annual counts of males on the leks (Fig. 1) show that their numbers fluctuate considerably from year to year.

You're probably thinking, "Well that's fine, but what does all that have to do with how many sharptails or sage grouse I can shoot?" The answer is, "Plenty." The fact is, a close relationship exists between the numbers of male sharptails or sage grouse counted in the spring and hunter success the following fall. Fig. 2 shows an example for sharptails near the Highwood Mountains in central Montana.

Another factor that helps in predicting hunter success is amount of spring rainfall. Our studies have shown that years with high nesting success (and hence high ratios of juvenile to mature birds in the fall, as determined from grouse wings turned in by hunters) typically have had wet springs. Drought years, like the one Montana is currently experiencing, always result in poor grouse production. Thus, all indications are that 1985 will be a relatively poor fall for prairie grouse hunting, especially in the drought-stricken portions of eastern Montana.

Both the spring surveys of males and spring rainfall, then, help predict hunter success and are important ingredients in preparing hunting regulations.

Hunting Regulations

Grouse hunting regulations, in a general way, are made up of three parts: opening date, season length, and bag limits. Season length controls total harvest when necessary, bag limits equitably distribute among hunters a limited resource, and opening date is a balance among rapidly changing weather conditions, age of juveniles, grouse behavior, and landowner considerations. Let's look at these three elements in more detail.

Opening date. Traditionally, grouse seasons have opened early in comparison with other hunting seasons—usually early September. When one considers several factors, a strong case can be made for these early openings. By early September, most juvenile prairie grouse have achieved approximately 75% of their growth and have become good fliers and sporting targets. Because most birds, including prairie grouse, experience high rates of natural mortality, it is prudent to open upland game bird seasons as early as possible while numbers of birds are still relatively high. In this way hunter mortality can substitute for natural mortality. Then, too, Montana prairie grouse are gregarious and gather in large flocks prior to winter. In contrast to scattered individual broods, which are easily approached and hold well for dogs, these large flocks of sage or sharp-tailed grouse are usually wary and difficult to approach. Early openings result in better hunting conditions and higher hunter success.

The potential for wildfire, which can be high during August, is almost always neutralized by early September due to a general pattern of heavy precipitation which occurs in late August and early September (see "Fires, Rain, and Grouse Seasons," *Montana Outdoors*, July/August 1978).

Season length. Twenty-seven years of population data indicate an annual mortality rate of 68% for sharptails and 66% for sage grouse. In other words, approximately two-thirds of all prairie grouse alive one year don't survive until the next. In fact, the annual turnover rates for all Montana game birds are very high, most of them higher than for prairie grouse.

The relationship of hunter harvest to mortality rate has

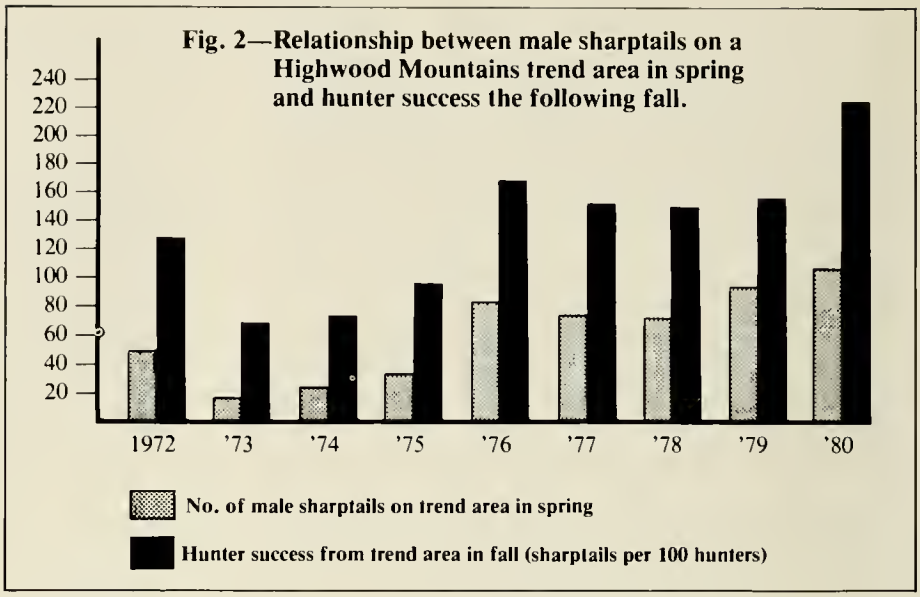


Fig. 2—Relationship between male sharptails on a Highwood Mountains trend area in spring and hunter success the following fall.

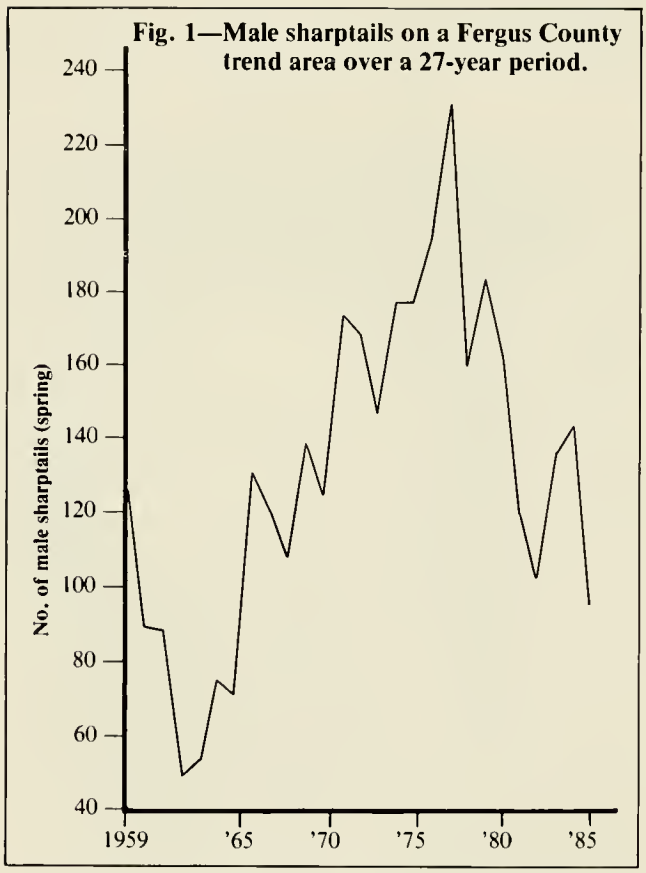


Fig. 1—Male sharptails on a Fergus County trend area over a 27-year period.

been studied in detail and is probably best demonstrated by a study of pheasants done in Wisconsin. In this study, hunter harvest of pheasants did not increase the naturally high mortality rate until 20% of the females were shot. Up to that point the mortality caused by hunters was apparently compensated for by a decrease in natural mortality.

Studies in Montana have shown that hunters harvest about 5% of the available sage grouse in lightly hunted Petroleum County, 10% of the sharptails in an intensively hunted area near the Highwood Mountains, and as few as 3% of the gray (Hungarian) partridge in a heavily hunted area near Great Falls. All of these levels are well below that required to in-

crease the total mortality rate. Thus, season length—the primary tool used to prevent overharvest—justifiably can be long in Montana because of the state's generally light bird hunting pressure.

Most sportsmen do most of their hunting early in the season, and tend to quit early if they are unsuccessful. This fact, along with the high turnover in grouse populations, allows liberal season lengths. From a biological standpoint, Montana's prairie grouse seasons could be even longer without adversely affecting the resource; however, other factors, particularly landowner/sportsman relations, have to be considered.

Bag limits. Changes in bag limits and possession limits—the primary means of equitably distributing harvest among hunters—have not been shown to have much impact on grouse populations. Bag limits in recent years traditionally have varied between three and six birds per day. Three is felt to be a point below which there would be little incentive to go hunting, and six is considered a maximum in terms of hunter opportunity. The ability to predict hunter success from the spring surveys is the most important element in setting the bag limit.

Landowner/Sportsman Cooperation

Recognizing that much of Montana's prairie grouse hunting occurs on private land, the Fish and Game Commission attempts to establish grouse seasons that minimize the impact of hunters on landowners yet allow sportsmen sufficient opportunity to harvest this rapidly renewable resource. Some of these considerations include:

1. Opening the grouse seasons in early September after a peak precipitation period to reduce fire danger.
2. Closing the seasons one week after general big game season to relieve hunter pressure on landowners.
3. Standardizing the seasons to the degree possible across the state to avoid concentrating hunters in certain areas.

Montana's sage and sharp-tailed grouse provide many hours of recreation and enjoyment for countless Montanans. The key to perpetuation of high-quality hunting opportunities for these species involves preservation of key habitat, skillful management, and continued cooperation between sportsmen and landowners. ■

* CACKLE, sound when flushed
Flying speed – 30 MPH
hollow
coarse
* ARTIST FIELD STUDIES
SHARP-TAILED GROUSE
—pediocaetes phasianellus
By D Maloney
TARSUS feathers to BASE of TOES
Summer usually stay on ground – in AUTUMN they often stay on slight in TREES
(LEK)